Vol. 1036 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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PATENTS

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

November 22, 1983 Volume 1036 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,645,835, Re. S.N. 533,914, Filed Sept. 19, 1983, Cl. 428/195, MOISTURE-VAPOR-PERMEABLE PRESSURE-SENSITIVE ADHESIVE MATERIALS, Martin E. Hodgson, Owner of Record: *Smith, T. J. & Nephew Ltd., Yorkshire, England,* Attorney or Agent: Albert L. Jacobs, Jr., Ex. Gp.: 164

3,767,884, Re. S.N. 488,527, Filed Apr. 29, 1983, Cl. 219/10.55D, ENERGY SEAL FOR HIGH FREQUENCY ENERGY APPARATUS, John M. Osepchuk, et al., Owner of Record: *Raytheon Co., Lexington, Mass.,* Attorney or Agent: William E. Clark, Ex. Gp.: 213

3,896,435, Re. S.N. 343,225, Filed Jan. 27, 1982, Cl. 343/9R, SIMPLE RADAR FOR DETECTING THE PRESENCE, SPEED AND RANGE OF TARGETS, James N. Constant, Owner of Record: *Inventor,* Attorney or Agent: Warren L. Kern, et al., Ex. Gp.: 222

3,920,510, Re. S.N. 384,612, Filed June 3, 1982, Cl. 162/162, PRESSURE AND HEAT SENSITIVE COPYING PAPER, Yoshihiro Hatano, et al., Owner of Record: *Yamamoto Kagaku Goset Kabushiki Kaisha, Osaka, Japan,* Attorney or Agent: James E. Armstrong, III, et al., Ex. Gp.: 173

4,287,949, Re. S.N. 529,757, Filed Sept. 6, 1983, Cl. 166/212, SETTING TOOLS AND LINER HANGER ASSEMBLY, Hiram E. Lindsey, Jr., Owner of Record: *MWL Tool and Supply Co., Midland, Tex.,* Attorney or Agent: Donald H. Fidler, Ex. Gp.: 356

4,306,791, Re. S.N. 438,003, Filed Nov. 1, 1982, Cl. 354/126, SINGLE LENS REFLEX CAMERA, Akihiko Hashimoto, Owner of Record: *Olympus Optical Co. Ltd., Tokyo, Japan,* Attorney or Agent: Ezra Sutton, et al., Ex. Gp.: 211

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,967,808, Reexam. No. 90/000,462, Requested: Oct. 24, 1983, Cl. 251/46, IRRIGATION VALVE WITH METAL SEAT, Calvin A. Lieding, Owner of Record: *Irrigation Specialties Co., San Gabriel, Calif.,* Attorney or Agent: Christie, Parker and Hale, Ex. Gp.: 341, Requester: Toro Co., Minneapolis, Minn.

4,355,572, Reexam. No. 90/000,459, Requested: Oct. 12, 1983, Cl. 99/516, APPARATUS FOR SEPARATING THE PULP FROM THE SKIN OF FRUIT SUCH AS TOMATOES, Jesus A. Silverstrini, Owner of Record: *IMDEC S.R.I., Mendoza, Argentina,* Attorney or Agent: C. Douglas McDonald, Jr., Ex. Gp.: 240, Requester: Israel Gopstein, Arlington, Va.

4,389,393, Reexam. No. 90/000,461, Requested: Oct. 18, 1983, Cl. 424/362, SUSTAINED RELEASE THERAPEUTIC COMPOSITIONS BASED ON HIGH MOLECULAR WEIGHT HYDROXYPROPYLMETHLCELLULOSE, Joseph M. Schor, et al., Owner of Record: *Forest Laboratories, Inc., New York, N.Y.,* Attorney or Agent: Jacobs & Jacobs, Ex. Gp.: 120, Requester: Dow Chemical Co., Midland, Mich.

PATENT NOTICES

Certificates of Correction for the Week of Nov. 22, 1983

D. 268,551	4,381,187	4,393,379	4,402,409
D. 269,219	4,381,742	4,393,409	4,402,427
4,260,467	4,382,097	4,393,693	4,402,542
4,320,122	4,382,502	4,393,770	4,402,550
4,335,071	4,383,386	4,393,772	4,402,573
4,347,701	4,383,595	4,393,866	4,402,816
4,350,398	4,384,345	4,394,459	4,402,881
4,358,562	4,384,483	4,394,976	4,403,027
4,358,579	4,384,497	4,395,143	4,403,228
4,358,754	4,384,713	4,395,287	4,403,467
4,362,865	4,385,059	4,395,390	4,403,531
4,363,483	4,385,826	4,396,013	4,403,922
4,367,525	4,386,893	4,396,407	4,404,845
4,369,775	4,387,508	4,396,431	4,405,112
4,369,829	4,389,113	4,397,715	4,405,273
4,370,540	4,389,376	4,397,741	4,405,314
4,371,825	4,389,628	4,398,263	4,405,320
4,372,138	4,389,826	4,398,336	4,405,347
4,376,401	4,389,882	4,398,520	4,405,349
4,377,129	4,390,366	4,398,940	4,405,356
4,378,410	4,390,506	4,399,237	4,405,369
4,379,190	4,390,963	4,399,585	4,405,563
4,379,491	4,391,422	4,399,599	4,406,465
4,380,649	4,391,618	4,399,927	4,406,647
4,380,966	4,392,096	4,400,938	4,407,684
4,380,983	4,392,812	4,401,398	

Disclaimers

3,941,441.—*Douglas Scheerhorn,* Grand Rapids, Mich. DRAWER INTERLOCK SYSTEM. Patent dated Mar. 2, 1976. Disclaimer filed Sept. 19, 1983, by the assignee, *Steelcase, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

4,225,875.—*Alfred Charles Ipri,* Princeton, N.J. SHORT CHANNEL MOS DEVICES AND THE METHOD OF MANUFACTURING SAME. Patent dated Sept. 30, 1980. Disclaimer filed Sept. 30, 1983, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

Disclaimers and Dedications

3,431,850.—*Glenn B. Christopher,* Arlington, Tex. SHAPED CHARGE AND METHOD OF MANUFACTURE THEREOF. Patent dated Mar. 11, 1969. Disclaimer and Dedication filed Sept. 26, 1983, by the assignee, *Jet Research Center, Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

3,784,983.—*John Presper Eckert, Jr.,* Gladwyne, *James R. Weiner,* Philadelphia, Pa., and *Robert F. Shaw,* Brooklyn, N.Y. and *Herbert Frazer Welsh,* Philadelphia, Pa. INFORMATION HANDLING SYSTEM. Patent dated Jan. 8, 1974. Disclaimer and Dedication filed Apr. 3, 1981, by the assignee, *Sperry Corp.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

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These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
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Colorado	Denver Public Library	(303) 571-2122
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
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	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REISSUES

NOVEMBER 22, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

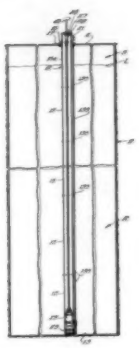
Re. 31,445
SUBMERGED PUMPING SYSTEM

James C. Carter, Pasadena, Calif., assignor to ITT, New York, N.Y.

Original No. 3,369,715, dated Feb. 20, 1968, Ser. No. 548,985, May 10, 1966. Application for reissue Oct. 19, 1977, Ser. No. 842,931

Int. Cl.[3] B65D *88/76;* B67D *5/50*

U.S. Cl. 222—333 30 Claims



5. A [pump and motor unit adapted for lowering through] *pumping system for liquefied gas comprising* a fluid transmitting conduit *and a pump and motor unit adapted to be lowered into the conduit* to pump fluid through the conduit [which comprises]. *said pump and motor unit comprising*

a motor casing of smaller diameter than the conduit,

a pump casing mounted on said motor casing having a discharge outlet surrounding the motor casing to discharge fluid into the conduit around the motor casing,

means on said pump casing defining a downwardly opening pump inlet adapted to receive fluid,

a motor in said motor casing,

a shaft extending from said motor through said pump casing,

impeller means on said shaft coacting with the pump casing to pump fluid from the inlet to the conduit, and

a tapered seat for said unit at the bottom of said conduit to mount the unit centrally in the conduit and to seal the bottom of the conduit except through the pump; *and means for purging the interior of the conduit.*

Re. 31,446
MANUAL OR AUTOMATIC CAMERA AND ELECTRONIC FLASH FOR USE THEREWITH

Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

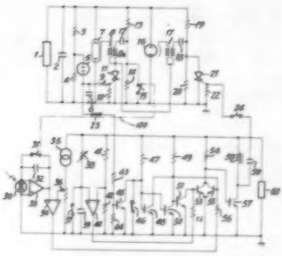
Original No. 4,196,988, dated Apr. 8, 1980, Ser. No. 880,800, Feb. 24, 1978. Application for reissue Mar. 31, 1982, Ser. No. 363,859

Claims priority, application Japan, Feb. 28, 1977, 52-20368

Int. Cl.[3] G03B *7/08, 15/05*

U.S. Cl. 354—33 14 Claims

1. In a camera, electrical exposure-time determining means, light-responsive electrical means, manually adjustable electrical means, and selector circuit means electrically connecting said light-responsive electrical means and said manually adjustable electrical means to said exposure-time determining means for selectively controlling the latter either by way of said light-responsive electrical means for automatically determining the exposure time in accordance with lighting conditions or by way of said manually adjustable electrical means for providing a manually determined exposure time, electronic flash means for providing, if necessary, additional flash illumination to be utilized for exposure, and electrical connecting means connecting said electronic flash means to said selector circuit



means for rendering the latter operable to control said exposure-time determining means by way of said light-responsive electrical means irrespective of whether said selector circuit means is set for controlling said exposure-time determining means by way of said light-responsive electrical means or said manually adjustable electrical means when additional flash illumination is required from said electronic flash means.

Re. 31,447
HIGH YIELD SILICON CARBIDE PRE-CERAMIC POLYMERS

Ronald H. Baney, and John H. Gaul, Jr., both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Original No. 4,298,558, dated Nov. 3, 1981, Ser. No. 171,553, Jul. 23, 1980. Application for reissue Apr. 16, 1982, Ser. No. 369,336

Int. Cl.[3] F27B *9/04*

U.S. Cl. 264—65 16 Claims

8. A method of preparing a silicon carbide-containing ceramic article which consists of

(A) forming an article of the desired shape from a polysilane having the average formula

$$\{(CH_3)_2Si\}\{CH_3Si\}$$

in which polysilane there is from 0 to 60 mole percent $(CH_3)_2Si=$ units and 40 to 100 mole percent $CH_3Si=$ units, wherein there is also bonded to the silicon atoms other silicon atoms and radicals having the formula

$$RO—$$

wherein R is an alkyl radical of 1 to 4 carbon atoms or phenyl wherein essentially all the remaining bonds on silicon are attached to chlorine or bromine atoms such that the polysilane contains from 24 to [35] *61* weight percent of RO— when R is a phenyl radical, and either 0 to 25 weight percent chlorine or 0–35 weight percent bromine, all based on the weight of the polysilane; and

(B) heating the article formed in (A) in an inert atmosphere or in a vacuum to an elevated temperature in the range of 1200° C. to 1600° C. until the polysilane is converted to a silicon carbide-containing ceramic article.

Re. 31,448

COATING COMPOSITIONS COMPRISING A POLYSULFONE AND FLUOROCARBON POLYMER

Terence E. Attwood, Staining, and Barry W. Farrant, Great Paxton, both of England, assignors to Imperial Chemical Industries, Ltd., London, England

Original No. 3,981,945, dated Sep. 21, 1976, Ser. No. 461,408, Apr. 16, 1974. Continuation of Ser. No. 47,244, Jun. 11, 1979, abandoned. Application for reissue Jan. 29, 1982, Ser. No. 344,173

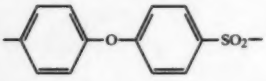
Claims priority, application United Kingdom, Nov. 19, 1973, 53583/73

The portion of the term of this patent subsequent to Sep. 21, 1993, has been disclaimed.

Int. Cl.[3] **C08L** *27/18, 81/06*

U.S. Cl. 428—422 **5 Claims**

10. A coating composition which comprises a polymer mixture of (a) 10% to 90% by weight of at least one thermoplastic aromatic polysulfone having reduced viscosity of at least 0.3 (as measured at 25° C. on a solution of the polymer in dimethyl formamide containing 1 g of polymer in 100 cm[3] *of solution) and repeat units*



only, and, correspondingly, (b) 90% to 10% by weight of at least one lubricant grade polytetrafluoroethylene powder of average particle size less than 20 μm as measured optically prepared by processes including comminution of a high molecular weight polytetrafluoroethylene, said composition being in the form of a dispersion of said lubricant grade polytetrafluoroethylene dispersed in a solution of said thermoplastic aromatic polysulfone in a solvent therefor.

Re. 31,449

FLUID-DRIVEN ROTARY ENGINE

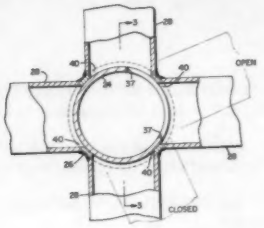
William A. Crider, 1216 Kelley St., S.W., Vienna, Va. 22180

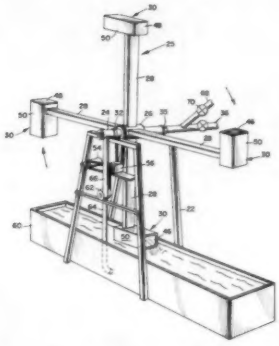
Original No. 4,260,902, dated Apr. 7, 1981, Ser. No. 964,171, Nov. 28, 1978. Application for reissue Sep. 30, 1982, Ser. No. 428,780

Int. Cl.[3] **F03B** *13/00, 13/10, 17/06;* **H02P** *9/04*

U.S. Cl. 290—43 **14 Claims**

14. A fluid driven rotary engine comprising at least one spoked wheel assembly mounted for rotation about a horizontally extending axis and comprising (a) a hub, (b) a set of angularly spaced apart wheel spokes extending radially from said hub and fixed at





their inner ends to said hub for rotation therewith, and (c) a set of liquid collection containers each associated with and fixed to a different one of said spokes at the outer end thereof, and a stationary, hollow fluid-conveying tubular member received in said hub for supplying water or other liquid under pressure to said wheel assembly, each of said spokes being hollow and opening into the interior of the container that is fixed thereto, and said tubular member and said hub having apertures arranged to establish fluid communication between the interior of said tubular member and each spoke for enabling liquid to flow through each spoke to the container at the outer end thereof for collection in the container as each spoke rotates through a pre-selected segment of the circular path of motion of said wheel assembly, said wheel assembly being rotated in a single pre-selected direction by the force-exerting weight of the liquid collected in said containers, and each of said containers having an open end and being arranged to dump the liquid collected therein through its open end as it is rotated with its associated wheel spoke beyond said pre-selected segment.

PLANT PATENTS

GRANTED NOVEMBER 22, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,141

ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Jan. 25, 1982, Ser. No. 342,658
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—8 1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by high centered, bright yellow blooms of heavy petallage borne singly and in large sprays (3 to 12 blooms).

5,142

ROSE PLANT MACCANTER

Samuel D. McGredy, P.O. Box 14100, Panmure, Auckland, New Zealand

Filed Jun. 28, 1982, Ser. No. 392,548
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the grandiflora rose class, substantially as shown and described, characterized particularly by currant red buds and flowers retaining color vibrancy upon aging borne one to a stem and in sprays but being capable of producing panicles of 12 to 25 blooms in late summer.

5,143

ILEX AQUIFOLIUM SELECTION

Rosendo Avila, Azusa, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Mar. 9, 1982, Ser. No. 356,334
Int. Cl.[3] A01H 5/12
U.S. Cl. Plt.—65 1 Claim

1. *Ilex aquifolium* 'Monvila' is a new and distinct selection as substantially shown and described herein, a superior selection characterized by a combination of notable characteristics of variegated foliage, compact habit, small foliage and having strictly male flowers.

5,144

CHRYSANTHEMUM NAMED TREASURE

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, Parrish, Fla.

Filed Mar. 19, 1982, Ser. No. 359,892
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—78 1 Claim

1. A new and distinct chrysanthemum cultivar, substantially as herein shown and described, characterized by its unique bright, clear yellow, incurve, standard bloom. This plant is vigorous with strong stems and capability for year round flowering with a substantially constant nine-week response.

PATENTS

GRANTED NOV. 22, 1983

ERRATA

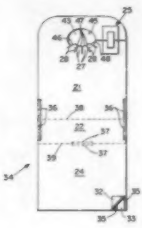
For CLASS	See PATENT NO.
053–071	4,416,093
604–020	4,416,274
350–003	4,416,540
417–386	4,416,599
502–055	4,416,798
502–156	4,416,799
502–159	4,416,800
502–153	4,416,801
502–209	4,416,802
502–209	4,416,803
502–213	4,416,804
502–067	4,416,805
502–074	4,416,806
381–094	4,417,098
364–513	4,417,102
369–060	4,417,103
377–018	4,417,135
123–490	4,417,201

PATENTS

GRANTED NOVEMBER 22, 1983

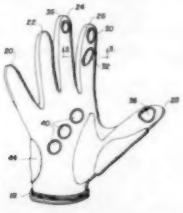
GENERAL AND MECHANICAL

4,416,025
BIB HAVING SEGMENTED NECK-APERTURE PERIMETRIC EDGE
David M. Moret, and Nicholas A. Ahr, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Apr. 22, 1983, Ser. No. 487,486
Int. Cl.³ A41D *27/12*
U.S. Cl. 2—49 R **10 Claims**



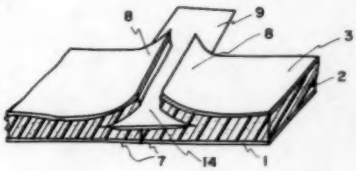
1. A bib of sheet material, said sheet material having a generally oval-shape neck accommodating aperture defined by a segmented perimetric edge, said perimetric edge being segmented by a plurality of bifurcations in said material which extend radially outwardly from said perimetric edge whereby said sheet material is rendered more conformant and compliant adjacent said neck-accommodating aperture.

4,416,026
MULTI-PURPOSE MECHANIC'S GLOVE
Michael C. Smith, 10931 Mills Choice Rd., Gaithersburg, Md. 20760
Filed Nov. 23, 1981, Ser. No. 323,893
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—161 R **10 Claims**



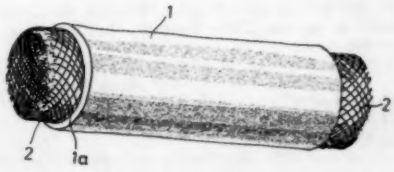
1. A multi-purpose mechanics glove adapted to cover substantially the entire hand from the wrist to the fingers comprising four finger stalls and a thumb stall, said glove being formed with a plurality of openings at selected locations to expose corresponding portions only of the hand of the mechanic wearing the glove, at least one opening of said plurality being formed in the palm of the hand to permit feel and control of tool handles and the like, an opening formed at the ball of the thumb for guiding and for cooperation with the user's index finger, at least two openings formed in the index finger stall, one at the ball of the index finger and a second at the palm side of the index finger stall, said second opening being of generally oval elongated shape to permit cooperation with the exposed area of the ball of the thumb in rolling in or rolling out motions of manipulation, said one opening at the ball of the index finger stall aiding in locating type uses of the index finger and permitting cooperation of the facing exposed portions of the balls of the index finger and the thumb in motions of fine manipulation, and the total area of the users hand exposed by the total of the areas of all of said plurality of openings comprising no more than 10% of the total area of said user's hand from the wrist to the finger tips.

4,416,027
DIVING SUIT SEAM CONSTRUCTION
Henry L. Perla, 1223 Harbour Island Rd., Orlando, Fla. 32809
Filed Jan. 31, 1983, Ser. No. 462,530
Int. Cl.³ A41D *27/22*
U.S. Cl. 2—275 **2 Claims**



2. A method of diving suit seam construction comprising:
providing two pieces of elastomeric material having interior and exterior surfaces and abutting edges;
cutting slits into the edges of the abutting pieces of elastomeric material;
gluing the abutting edges of the two pieces along the exterior surfaces while the abutting edges of the interior surfaces are folded outward;
stitching the exterior surface edges of the pieces;
inserting a strip of elastomeric material inside the cavity formed by the seam of the abutting edges of the exterior surfaces and the outwardly folded interior surfaces; and
bringing the outwardly folded interior surfaces into abutting relationship and gluing their edges together to form the finished seam.

4,416,028
BLOOD VESSEL PROSTHESIS
Ingvar Eriksson, Yxklinge, Rasbokil; Staffan Bowald, Fiskartorpet, Rasbo, both of S-755 90 Uppsala, and Christer Busch, Nya Valsätravägen 17B, S-752 46 Uppsala, all of Sweden
PCT No. PCT/SE80/00161, § 371 Date Jan. 22, 1981, § 102(e) Date Jan. 22, 1981, PCT Pub. No. WO80/02641, PCT Pub. Date Dec. 11, 1980
PCT Filed Jun. 4, 1980, Ser. No. 230,942
Int. Cl.³ A61F *1/24*
U.S. Cl. 3—1.4 **10 Claims**



1. A blood vessel prosthesis comprising a tubular support

member of an at least partially non-resorbable material without adverse tissue reaction, and at least one inner wall member of a resorbable material without adverse tissue reaction supported by said tubular member and forming a substantially concentric inner wall structure thereto, said inner wall structure being sufficiently porous to permit the passage of blood cells, such as erythrocytes and thrombocytes, through the free inner surface and into at least a substantial part of the thickness thereof, thereby providing a support inside said tubular support member for the formation of a layer of thrombotic material whereby an endothelium coated muscle layer is formed on said tubular support member.

4,416,029

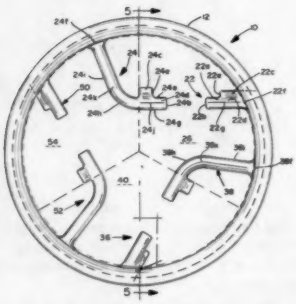
TRILEAFLET PROSTHETIC HEART VALVE

Robert L. Kaster, 2730 Vagabond La., Plymouth, Minn. 55447

Filed May 11, 1981, Ser. No. 262,635

Int. Cl.³ A61F *1/22*

U.S. Cl. 3—1.5 **42 Claims**



1. Heart valve comprising:

a. means for housing in a heart and including an internal orifice for blood flow;

b. means projecting inwardly of and spaced about said housing means, said projecting means including a spread plurality of short and long projections; and,

c. means for symmetrically and substantially synchronously moving between occluding and non-occluding positions in said housing means, said occluding means including a like plurality of leaflets including means for freely engaging and moving about each of said plurality of short and long projections, each of said plurality of said short and long projections defines an axis about which each of said leaflets moves between said occluding and non-occluding positions, each of said axes operationally bisects said leaflet asymmetrically and unequally whereby each of said leaflets symmetrically and substantially synchronously moves about a said axis with respect to each other in a predetermined geometrical path thereby providing for distributed blood flow through said housing means.

4,416,030

COMPACT ADJUSTABLE SPA JET AERATOR

Arturo S. Reynoso, 27933 Oakmoor, Canyon County, Calif. 91351

Filed Sep. 30, 1982, Ser. No. 431,297

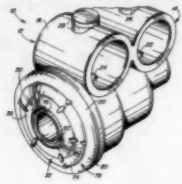
Int. Cl.³ E04H *3/18*; A61H *33/02*; E03C *1/02*

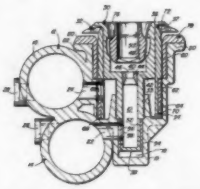
U.S. Cl. 4—496 **11 Claims**

1. An improved compact adjustable spa jet aerator, comprising, in combination:

(a) a hollow housing having an elongated passageway therein extending to an exit in the exterior surface thereof, said housing defining an air conduit and a water conduit spaced therefrom in stacked relation adjacent to the same side of said passageway, to render said aerator compact and openings in said conduits communicating with said passageway;

(b) separate concentric water adjusting means and air adjusting means, each comprising a cylindrical sleeve with a side aperture therein alignable with one of said conduit openings to control the flow of fluid from said conduit, said sleeve being threadably secured for rotation into and





out of said passageway, the inner one of said water and air sleeves defining an aerating chamber in said passageway in communication with said conduits through said conduit openings and apertures; and,

(c) flexible resilient seal means secured to the exterior of said sleeves to prevent leakage of water and air from said aerator.

4,416,031

MACHINE ADAPTED FOR USE IN THE MANUFACTURING OF SHOES

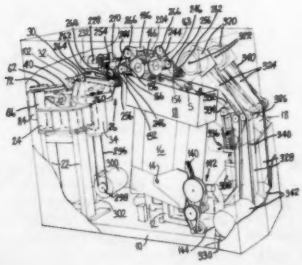
Joseph A. Shutt, Rearsby; Kingsley J. Tutt, Birstall; Malcolm Tillyard, Leicester, and Terence J. Brown, Wigston Magna, all of England, assignors to USM Corporation, Farmington, Conn.

Filed Jun. 5, 1981, Ser. No. 270,991

Claims priority, application United Kingdom, Jun. 10, 1980, 8019008

Int. Cl.³ A43D *3/00*; C14B *1/44*

U.S. Cl. 12—127 **10 Claims**



1. A shoe support for a machine for use in the manufacture of shoes, comprising toe end support means, a heel end support arrangement, including heel clamping means for clamping a heel end of a shoe supported thereby, and means for effecting relative movement of approach therebetween to accommodate to the size of shoe to be supported thereby, wherein a "shoe

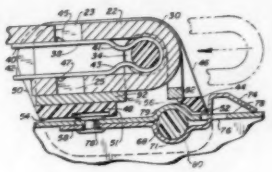
present" sensing device is provided upon actuation of which relative movement of approach is caused to take place between the toe end support means and heel end support arrangement, said sensing device being supported by the toe end support means in such a manner that it can be actuated by a shoe placed in said toe end support means.

4,416,032

CONNECTOR ADAPTOR FOR PIN-TYPE BLADE

Michael G. Mohnach, 252 Green Acres Dr., and William H. Harbison, 182 Moorland Dr., both of Valparaiso, Ind. 46383

Filed Oct. 5, 1981, Ser. No. 308,403
Int. Cl.³ B60S *1/40*
U.S. Cl. 15—250.32 **6 Claims**



1. An adaptor for connecting a pin-type wiper blade to a hook-type wiper arm, said wiper blade having a channel therethrough extending transversely to the length thereof and a spring retention clip mounted therein, said wiper arm having a hooked end comprising:

first and second spaced apart walls, both walls being parallelogram-shaped and having aligned openings in the lower portion thereof, said openings being aligned with said channel;

a shouldered pin having a reduced diameter portion extending between an upper portion of the first and second walls;

a U-shaped spring clip disposed about the reduced diameter portion of the shouldered pin, said hooked end of said wiper arm being disposed over said spring clip and said shouldered pin to secure the adaptor to the wiper arm; and

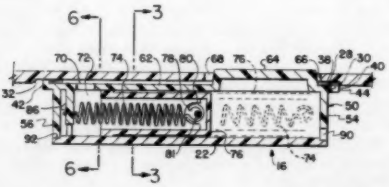
a retention pin having a reduced diameter central section and an enlarged diameter portion on one of the ends thereof, said pin extending through said aligned openings and said channel so that the reduced diameter central section is captured by the spring retention clip and the enlarged diameter portion contacts one of said walls to secure the adaptor to the wiper blade.

4,416,033

FULL BAG INDICATOR

Glenn E. Specht, Massillon, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Oct. 8, 1981, Ser. No. 309,575
Int. Cl.³ A47L *9/19*
U.S. Cl. 15—339 **3 Claims**



1. A bag condition indicator for a vacuum cleaner, including;

(a) a vacuum cleaner shell,

(b) an aperture in said shell,

(c) a housing for said bag condition indicator,

(d) a spring urged piston mounted in said housing such that air may flow between said housing and said piston,

(e) an aperture in said housing in an air flow path between said shell aperture and said piston,

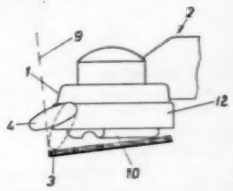
(f) said housing being movably mounted on said shell to vary the flow area of one of said apertures to thereby alter the flow rate of atmospheric air passing through said housing aperture.

4,416,034

FRONT-SUCTION ARRANGEMENT ON A VACUUM CLEANER

Heinz-Jürgen Ahlf, Berg.-Gladbach, and Wieland Gühne, Remscheid, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Oct. 22, 1981, Ser. No. 313,757
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041881
Int. Cl.³ A47L *9/02*
U.S. Cl. 15—354 **7 Claims**



1. A device for front suction on a vacuum cleaner including a housing having a front side as viewed in a direction of traveling of the vacuum cleaner and a bottom plane, comprising lifting means mounted to said front side and operative for lifting said front side from a floor in response to a counter pressure exerted on said lifting means by a limiting surface when said lifting means is brought into contact with said limiting surface, said lifting means including a pivotable lever pivotable about a pivot point located on said front side of the housing at a predetermined distance from said bottom plane, said lever being longer than said predetermined distance and being spring-loaded in said direction of traveling and adapted to pivot in the direction of the floor under said counter pressure and thus lift said front side when the lever rests against the floor.

4,416,035

SAFETY BAR CUTOFF AND BRAKE

Robert C. Schwartz, Lubbock, Tex., assignor to Horn & Gladden Lint Cleaner Company, Inc., Lubbock, Tex.

Filed Oct. 9, 1981, Ser. No. 310,109
Int. Cl.³ D01G *31/00*
U.S. Cl. 19—0.2 **10 Claims**

1. An emergency stop for textile machinery having:

a. a frame having two sides,

b. feed rollers within the frame,

c. an electric motor for rotating the rollers on the frame,

d. rotatable transmission means connecting the rollers and motor,

e. a housing on the frame over the rollers, and

f. an opening in the housing over the rollers;

wherein the improvement comprises:

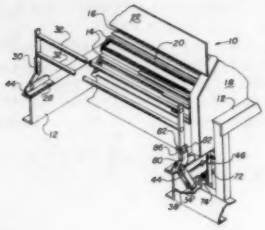
g. an actuator arm pivoted to each side of the frame,

h. an actuator bar attached to the arms extending across the housing at the opening,

i. a trip plate pivoted to the frame,

j. the trip plate having a run position and a stop position,

k. a helical tension trip spring biasing the trip plate to the stop position,
l. a notch in the trip plate,
m. a sear on one of the actuator arms in the notch,
n. so that movement of the actuator bar toward the rollers moves the sear from the notch which allows the trip spring to move the trip plate to the stop position,
o. a helical tension actuator spring on the actuator arm biasing the sear into the notch,
p. an electrical switch on the frame with a switch arm bearing against the trip plate when in the run position,



q. electrical wires connecting the switch to the motor so as to stop the motor when the trip plate moves to the stop position,
r. a brake assembly on the frame,
s. the brake assembly having
t. a stop position to brake the transmission means, and
u. a run position to disengage the brake assembly from the transmission means,
v. a helical tension brake spring biasing the brake assembly in the stop position, and
w. a pitman attached to the trip plate holding the brake assembly in a run position when the trip plate is in the run position.

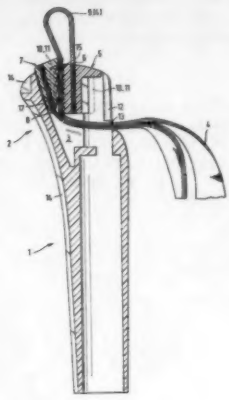
4,416,036

FASTENING MEANS FOR THE WRIST STRAP OF A SKI STICK AND METHOD FOR THE MANUFACTURE THEREOF

Yrjö Aho, Espoo, Finland, assignor to Exel Oy, Helsinki, Finland

Filed Feb. 9, 1982, Ser. No. 347,323
Claims priority, application Finland, Feb. 16, 1981, 810471
Int. Cl.³ A63C *11/22*
U.S. Cl. 24—136 R **3 Claims**

1. A ski stick handle including fastening means for forming a wrist strap loop thereto, said fastening means being positioned in a cavity (3) in a knob-shaped member (2) of said stick handle (1) as a removable unit separable from said knob-shaped member, said unit comprising two discrete plastic elements (5,7) between which a wrist strap (4) can be locked as desired, characterized in that said two discrete plastic elements (5,7) have embedded therein the opposite ends of said wrists strap (4) and that one (5) of said plastic elements is anchored by profile locking (10,11) in anchoring grooves (10) on interior walls of said cavity (3) in such a position that the junction (6) of said wrist strap and said one plastic element (4) is on the top face of said one plastic element (5), and the other of said plastic elements (7) is wedged into a downwardly converging space between said interior cavity wall (3) and said one plastic element (5) in such a position that the junction (8) of said wrist strap and said other plastic element is on the lower face of said other plastic element, the portion of said wrist strap (4) between said plastic elements (5,7) being passed between said plastic elements (5,7) and through an aperture opening (13) in



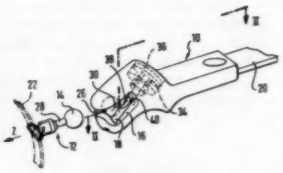
the sidewall of said knob-shaped member (2) thereby forming a loop.

4,416,037

RELEASABLE CONNECTOR IN LEASHES FOR DOMESTIC ANIMAL, SAFETY LINE OR THE LIKE

Rudolf Panthöfer, St. Augustin, and Hans Ley, Much, both of Fed. Rep. of Germany, assignors to Tetra Werke Dr. rer. nat. Ulrich Baensch GmbH, Melle, Fed. Rep. of Germany

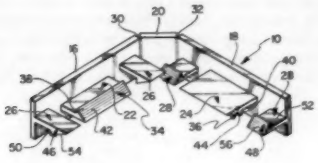
Filed Jul. 6, 1981, Ser. No. 280,520
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026418
Int. Cl.³ A44B *17/00*
U.S. Cl. 24—665 **8 Claims**



1. A releasable connector, for use with a tension line and, comprising:
a coupler formed with a neck and a spherical spherically shaped head,
a holder formed with an axis and having oppositely disposed first and second ends disposed on said axis, said first end being adapted for connection to such tension line and said second end being adapted for coupling to said coupler such that tension applied to such line will direct the resultant force along said axis, said holder including a guide channel extending lateral to said axis and opening to one side of said holder for receipt of said head, said holder being formed at said second end with an axially through, laterally opening, recess for receipt of said neck, said holder being still further formed with a lock bolt-receiving, through bore coextensive with said axis and,
a lock bolt received telescoptically in said bore and extending into said guide channel for holding said head captive in said channel, said lock bolt being formed on one side thereof with a recess for registration with said head when said bolt is telescoped to an unlocked position to provide for passage of

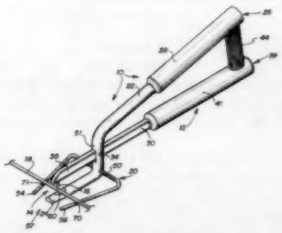
said head between said recess and the opposite side of said channel to free said head for release from said channel.

4,416,038
BALLOON CLIP
Joseph A. Morrone, III, Westerly, R.I., assignor to Adecon, Inc., Warwick, R.I.
Filed May 24, 1982, Ser. No. 381,535
Int. Cl.³ A44B *21/00*
U.S. Cl. 24—255 SL **5 Claims**



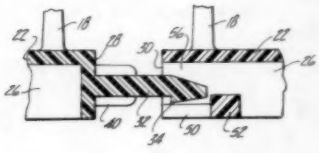
1. A closure device for sealing the flexible tubular stem of an inflated balloon and the like comprising:
a. a first leg;
b. a second leg;
c. hinge means interconnecting said first and second legs so that they are movable to closed positions thereof wherein they are in substantially parallel spaced relation;
d. means for retaining said legs in the closed positions thereof;
e. a first closure member attached to said first leg and extending generally toward said second leg when said legs are in the closed positions thereof and including a raised shoulder thereon having a beveled outer surface which extends generally to the terminal end of said first closure member;
f. a second closure member attached to said second leg and is of substantially the same configuration as said first closure member, said second closure member extending outwardly from said second leg in inverted, slightly offset relation to said first closure member with the raised shoulders of said closure members on the same respective sides thereof as the opposite respective closure members, whereby when said legs are moved to the closed position thereof said closure members are deflected slightly to permit the passage of the shoulders thereof into interlocked relation with the shoulders thereof cooperating to define a tortuous path for sealingly securing said stem.

4,416,039
ARTERY OR VEIN PERFORATOR
Judith A. Miller, P.O. Box 5068, Pine Bluff, Ark. 71611
Filed Jun. 26, 1981, Ser. No. 277,911
Int. Cl.³ A01N *1/00*
U.S. Cl. 27—21 **24 Claims**



1. Apparatus for perforating tubular conduit members, said apparatus comprising:
handle means adapted to be grasped manually by a user of said apparatus;
jaw means adapted to close in response to compression of said handle means;
needle means associated with said jaw means for puncturing a tubular conduit member when said jaw means closes
said jaw means including groove means for properly positioning said tubular conduit member with respect to said needle means; and,
fork means pivotally secured relative to said jaw means to facilitate manipulation of said tubular conduit member.

4,416,040
WEAVING LOOM WITH INTERCHANGEABLE SECTIONS
John A. Towsley, Ann Arbor, Mich., assignor to John Alan Enterprises, Ann Arbor, Mich.
Filed May 29, 1981, Ser. No. 268,267
Int. Cl.³ D03D *29/00*
U.S. Cl. 28—152 **4 Claims**



1. A weaving loom having a plurality of individual sections connected together in end-to-end abutment to form a closed frame on which an article may be woven wherein said sections include pegs upstanding on said sections and canted outwardly away from the area bounded by the closed frame and wherein at least one of the connections between two abutting sections comprises a resilient tongue on one of said two sections projecting into a slot of the other of said two sections, a catch on the tongue, bridge means on said other section engaged by the tongue catch for rendering said two sections incapable of disconnection by means of an axially applied force, and guide and guideway means on respective ones of said two sections constructed and arranged in relation to each other to axially align said two sections, said guide and guideway means and said tongue catch and bridge means further being constructed and arranged in clearance relation to each other to allow said two sections to be twisted relative to each other about a transverse axis passing through their abutting ends in an amount which allows the tongue catch to clear said bridge means on said other section engaged by the tongue catch thereby to allow said two sections to be disconnected by such twisting.

4. A loom frame section comprising a main body having ends adapted to abut ends of adjacent sections and connection means at the ends of the main body for connection with adjacent sections, pegs upstanding on said section and canted outwardly thereon, the connection means at one end of the main body comprising a resilient tongue including a catch and guides on opposite lateral sides of the tongue, the connection means at the other end of the main body comprising a slot, guideways in the slot complementary to the guides for reception of like guides of an adjacent abutting section, and a bridge extending transversely across the slot to provide interlocking connection with a like tongue catch of such adjacent abutting section such that said loom frame section and such adjacent abutting section, when connected together, are incapable of being disconnected by means of an axially applied force, said guides and guideways being constructed and arranged in relation to each other to provide axial alignment of said loom frame section and such adjacent abutting section, when connected together, said guides and guideways and said tongue catch and bridge being constructed and arranged in clearance

relation to each other to allow said loom frame section and such adjacent abutting section, when connected, to be twisted relative to each other about a transverse axis passing through their abutting ends in an amount which allows the tongue catch of such adjacent abutting section to clear said bridge and allow disconnection of such adjacent abutting section from said loom frame section.

4,416,041

APPARATUS FOR THREADING A THREAD INTO A TEXTURIZING NOZZLE

Peter Gujer, Winterthur; Dieter Guldenfels, Dinhard; Armin Wirz, Ossingen, all of Switzerland; Hans Knopp, Ludwigshafen, Fed. Rep. of Germany; Dieter Herion, Frankenthal, Fed. Rep. of Germany, and Gerhard Conzelmann, Otterstadt, Fed. Rep. of Germany, assignors to Rieter Deutschland GmbH, Reutlingen, Fed. Rep. of Germany

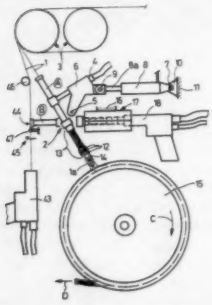
PCT No. PCT/EP79/00019, § 371 Date Dec. 11, 1979, § 102(e) Date Dec. 11, 1979, PCT Pub. No. WO79/00956, PCT Pub. Date Nov. 15, 1979

PCT Filed Mar. 24, 1979, Ser. No. 185,906

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1978, 2817487

Int. Cl.³ D02G *1/12, 1/16*

U.S. Cl. 28—255 **8 Claims**



3. In an apparatus for texturing thread, the combination comprising

a texturing nozzle for texturing a moving thread, said nozzle having a thread inlet opening at one end, a thread outlet opening at an opposite end and a plurality of lateral outlet openings between said inlet opening and said outlet opening, said nozzle being movable between a threading-in position and a texturing position;

a suction device for selectively generating a suction air stream within said nozzle to draw a thread into said nozzle outlet opening in communication with said suction device at said threading-in position; and

a closable device movable between a closed state forming a sealed duct about said lateral openings and extending to said suction device in said threading-in position and an opened state to permit movement of said nozzle from said threading-in position to said texturing position.

4,416,042

METHOD AND APPARATUS FOR RAISING THE RAM OF A VERTICAL MILLING MACHINE

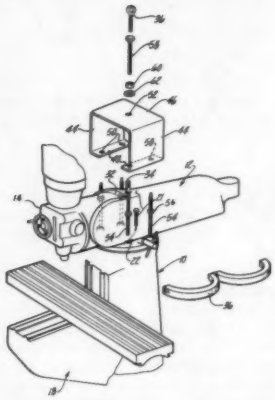
Ashford J. Hinson, 19969 Poinciana Ave., Redford, Mich. 48240

Filed Dec. 31, 1981, Ser. No. 336,094

Int. Cl.³ B23B *47/26, 1/02;* B23Q *3/10*

U.S. Cl. 29—57 **10 Claims**

1. A fixture for raising the ram from the base of a milling machine of the type wherein the ram is mounted on the base by means of four mounting bolts, two at each side of the ram, which extend down through openings in a base flange on the ram and thread into registering threaded openings on a support mounted in a horizontally fixed position on the base, said ram having a raised central portion between said bolt openings which is provided with a threaded vertical opening for receiving an eye bolt for lifting the ram, said fixture comprising an inverted, generally U-shaped bracket having a pair of vertically extending legs interconnected at their upper ends by a bight section, the lower ends of said legs having laterally extending flanges thereon, said legs and bight section being dimensioned such that the bracket can be placed on the ram in an elevated position with the flanges registering vertically with the mounting bolt openings in the base flange of the ram with the bight section spanning the raised central portion of the ram and spaced thereabove, said laterally extending flanges having openings therein adapted to register with the bolt openings on the base flange of the ram, a guide screw extending vertically through each opening in said laterally extending flanges and



adapted to be extended through the bolt openings in the base flange and threaded into the openings in said support after the mounting bolts have been removed therefrom, a stop on each screw located substantially above the lower end thereof and adapted to bear against the lower side of each of said flanges to support the bracket in said elevated position, said bight section having an opening therein registering vertically with the eye bolt opening in the central raised portion of the ram when the bracket is mounted in said elevated position, a lift screw extending downwardly through the opening in the bight section of the bracket and adapted to be threaded into and locked against rotation in said eye bolt opening and a nut threaded on said lift screw and adapted to bear down against the top face of the bight section so that, when the nut is threaded downwardly on the lift screw while bearing against the top face of the bight section, the lift screw is displaced upwardly to thereby raise the ram while it is guided vertically by the four guide screws which are threaded into said support.

4,416,043

DISC ROLL

Susumu Aoki, Yokohama; Hiroshi Asaumi, Kamakura; Shigeo Take, Ayase, and Masazumi Akase, Yokohama, all of Japan, assignors to Nippon Asbestos Company, Limited, Tokyo, Japan

Filed May 8, 1981, Ser. No. 262,029

Claims priority, application Japan, May 12, 1980, 55-61749

Int. Cl.³ B21B *27/00*

U.S. Cl. 29—132 **6 Claims**

1. A disk roll made of a thin sheet, said thin sheet being prepared from a mixture of flaky vermiculite particles having a diameter of 1 mm or less and a thickness of 100μ or less obtained by pulverizing expanded vermiculite with 40 to 230%

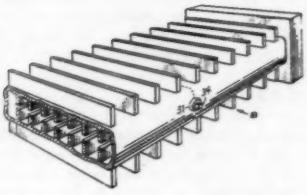
weight, on the basis of the amount of vermiculite, of wallastonite fibers having a length of 3 mm or less in accordance with the sheet-forming process of a paper making technique.

4,416,044

CAST RECUPERATOR TUBE

Richard F. Stockman, Friendship, and Paul L. Macler, Wellsville, both of N.Y., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Apr. 2, 1981, Ser. No. 246,214
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—157.3 R **13 Claims**



1. A method of casting a hollow metallic envelope having a desired interior surface shape and a desired exterior surface shape comprising the steps of:

a. forming a sand core contoured to provide the desired interior surface shape of the metallic envelope and having integral therewith protuberances extending laterally outward therefrom, said sand core being formed of two end modules and at least one center module adapted to mate in end-to-end abutment;

b. forming independent upper and lower portions of a sand mold which mate to form a cavity adapted to receive the sand core and contoured to provide the desired exterior surface shape of the metallic envelope and having passageways formed therein that include sprues and gates for the pouring of molten metal into the cavity, the upper and lower portions of the sand mold having depressions for receiving the protuberances extending laterally outward from the sand core;

c. placing the sand core into the lower portion of the sand mold with the protuberances extending from the sand core fitted in the depressions in the lower portion of the sand mold whereby the sand core is supported within the cavity of the sand mold so as to form a lower clearance space therebetween;

d. placing the upper portion of the sand mold over the sand core with the depressions therein fitted on the protuberances extending from the sand core thereby abutting the upper portion of the sand mold with the lower portion of the sand mold thereby forming an upper clearance space between the sand mold and the sand core continuous with the lower clearance space therebetween;

e. enclosing the abutting upper and lower portions of the sand mold in a stongback thereby imparting rigidity to the sand mold; and

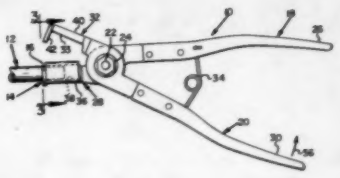
f. pouring a quantity of molten metal into the sprues and gates of the sand mold to supply molten metal into the clearance space that upon cooling solidifies to the hollow metallic envelope.

4,416,045

SNAP RING REMOVAL TOOL

Harold D. Staten, Medford, Oreg., assignor to Helen Donaldson; Melody J. Donaldson, both of Medford and Tracey Donaldson Decker, Gold Hill, all of, Oreg.

Continuation of Ser. No. 116,869, Jan. 30, 1980, abandoned. This application Dec. 14, 1981, Ser. No. 330,269
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—229 **3 Claims**



1. A pliers-type snap ring removal and installation tool comprising:

first and second elongated crossed pliers members pivotally interconnected at their intersection to define a handle portion and a head portion on opposite sides of the pivotal interconnection;

a shaft receptacle at the end of the head portion of the first member for receiving a shaft lengthwise of the handle portion of the first member by movement of the shaft receptacle longitudinally of said shaft into a position rearwardly adjacent an annular snap ring groove in the shaft; and

a ring-engaging means at the end of the head portion of the second member and forward of the shaft receptacle for engaging a split snap ring at two points along opposite lateral sides of the shaft, one point on each lateral side of the split in the snap ring, as the ring-engaging means is moved laterally of said shaft toward the shaft receptacle by pivoting the handle portion of the second member toward a position lengthwise of the shaft;

the shaft receptacle and ring-engaging means being sized and arranged to fit through a narrow opening surrounding said shaft, so that positioning the tool with a shaft received lengthwise in the shaft receptacle, a split snap ring can be installed in the annular snap ring groove in the shaft by positioning the snap ring in the groove with the split straddling the shaft and squeezing the handle portions of the tool together and the split snap ring can be removed from said shaft by positioning the tool lengthwise on the shaft with the split in the ring facing the ring engaging means and squeezing the handle portions of the tool together;

the shaft receptacle being positioned nearer the intersection of the pliers members than the ring-engaging means so that the tool can be slid axially along the shaft into abutment with the snap ring to position the ring engaging means for engaging the snap ring.

4,416,046

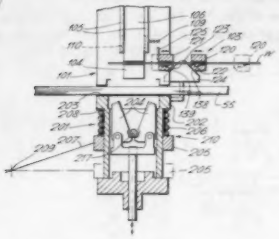
METHOD OF BINDING SHEETS USING STITCHERS

Ronald E. Stokes, Newport Pagnell, England, assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 106,422, Dec. 21, 1979, Pat. No. 4,358,040. This application Jun. 10, 1982, Ser. No. 387,080
Int. Cl.³ B23P *17/00*
U.S. Cl. 29—417 **1 Claim**

1. A method of binding a set of sheets comprising cutting a piece of wire from a supply of wire, forming said cut wire into a staple, and driving said staple through a set to bind the sheets together, the improvement including the step of determining the length of said piece of wire automatically in accordance

with the thickness of said set of sheets, said step of determining being effected by the step of advancing the wire by a fixed distance and then further advancing the wire by a distance



dependent upon the thickness of the set and the step of positioning a wire cutter in accordance with the thickness of the set.

4,416,047

METHOD OF MANUFACTURING A SHUTTER LINK

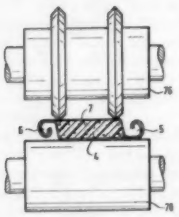
Gustav Riexinger, Brackenheim-Hausen, and Rudolf Nagel, Schöneich, both of Fed. Rep. of Germany, assignors to Tuerenwerke Riexinger GmbH & Co., KG, Brackenheim-Hausen, Fed. Rep. of Germany

PCT No. PCT/EP80/00066, § 371 Date Oct. 2, 1981, § 102(e) Date Oct. 2, 1981

PCT Filed Jul. 30, 1980, Ser. No. 308,552

Int. Cl.³ B23P *3/00, 19/04*

U.S. Cl. 29—460 **18 Claims**



1. In a method of manufacturing a shutter link for a multi-link overhead shutter or roller blind comprising forming a hollow section by assembling two sheet-metal shells, filling the cavity of the hollow section with a heat-insulating compound, providing said hollow section at its longitudinal sides with hinge elements and with two slots disposed adjacent to the two hinge elements and extending the length of the shutter link, defining said slots by bending flanges from the shell wall inwardly towards the cavity, the slots being disposed on one wide side of the shutter link, the slots being bridged by narrow webs defined by slot interruptions, and providing the flanges of the slots on their side facing the cavity with notches formed adjacent to the bending lines and extending parallel to the slot, the improvement comprising the steps of forming an additional notch centrally between said notches on the side of one of said shells facing away from said cavity and press forming said slots by pressing in on said shell to tear said shell along the additional notch.

4,416,048

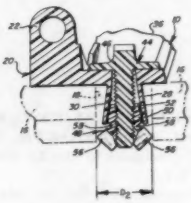
TOILET SEAT MOUNTING ARRANGEMENT

Timothy J. Otte, Sheboygan Falls, Wis., assignor to Bemis Manufacturing Company, Sheboygan Falls, Wis.

Filed Nov. 30, 1981, Ser. No. 326,019

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—526 R **14 Claims**



1. An arrangement for attaching a toilet seat to a toilet bowl, said bowl defining at least one mounting hole, comprising:

a base adapted to be supported upon said bowl, the upper portion of said base having an integral hinge post for hingedly mounting said seat to said base, and the lower portion of said base including a stem having a longitudinal bore, said stem being disposed in said mounting hole, and

removable fastener means including a bolt disposed within said bore and expandable nut means threaded on said bolt so that the arrangement is insertable into said hole, and said bolt operates from the seat side of said bowl to expand said nut means toward engagement with the periphery of said mounting hole for securely maintaining said arrangement affixed to said seat thereby providing a secure hinge mounting for said seat.

4,416,049

SEMICONDUCTOR INTEGRATED CIRCUIT WITH VERTICAL IMPLANTED POLYCRYSTALLINE SILICON RESISTOR

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 910,248, May 30, 1970, abandoned. This application Jan. 8, 1981, Ser. No. 223,446

Int. Cl.³ H01L *21/22*

U.S. Cl. 29—571 **5 Claims**

5. A method of making a transistor and a non-rectifying resistor element in an integrated circuit comprising the steps of:

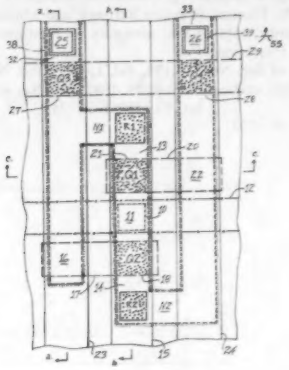
(a) depositing polycrystalline silicon on a face of a semiconductor body and patterning to define a transistor gate, and introducing impurity to make the gate highly conductive and to form a conductive area to provide electrical contact to one side of the resistor and to provide a region of the transistor;

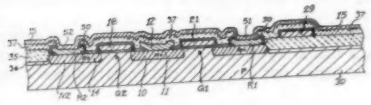
(b) depositing material on said face directly over said conductive area and also separately over an interconnect area spaced from said conductive area, said material exhibiting substantial resistivity;

(c) introducing impurity into said interconnect area to create a low resistance interconnect for the transistor while masking said material over said conductive area; and

(d) depositing a conductive coating directly over said mate-

rial to provide electrical contact to the other side of the resistor, whereby the resistor is provided by the said





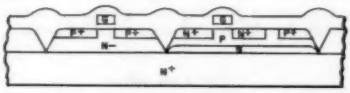
material in a vertical direction between said electrical contacts.

4,416,050

METHOD OF FABRICATION OF DIELECTRICALLY ISOLATED CMOS DEVICES

John C. Sarace, Temecula, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 24, 1981, Ser. No. 305,247
Int. Cl.³ H01L *21/265*
U.S. Cl. 29—571 6 Claims



1. A method of fabricating an isolation structure between semiconductor devices on a body of semiconductor material of a first conductivity type and a first dopant concentration to retard latch-up effects between devices comprising the steps of:

depositing a layer of semiconductor material of said first conductivity type and a second dopant concentration on said body of semiconductor material;

defining an etchant resistant and oxide inhibiting masking pattern on a major surface of said layer of semiconductor material where distinct silicon islands and corresponding semiconductor devices are to be formed;

etching openings in said layer at regions defined by said pattern, said openings extending through said layer to said body;

depositing dopant species of a second conductivity type in predetermined ones of said silicon islands so that the major surface and exposed edges of said ones of said islands becomes second conductivity type;

thermally oxidizing the exposed surface portions of said body of semiconductor material so that oxide fills said openings and electrically and physically separates the silicon islands;

removing said oxide inhibiting masking pattern;

thermally oxidizing the exposed surface portions of said body of semiconductor material to form a thin oxide layer over the major surface of said silicon islands;

forming a gate element on said thin oxide layer on said silicon islands;

selectively providing a first dopant species of second conductivity type in silicon islands of first conductivity type, and a second dopant species of first conductivity type in silicon islands of second conductivity type, thereby forming source and drain regions of a field effect transistor; and

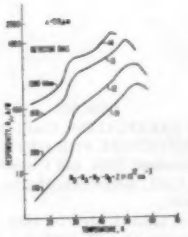
selectively removing portions of said thin oxide layer to form contact areas to said active regions.

4,416,051

RESTORATION OF HIGH INFRARED SENSITIVITY IN EXTRINSIC SILICON DETECTORS

Richard N. Thomas, Murrysville, and Timothy T. Braggins, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 5,535, Jan. 22, 1979, Pat. No. 4,246,590.
This application Jul. 7, 1980, Ser. No. 166,421
Int. Cl.³ H01L *21/225*
U.S. Cl. 29—572 8 Claims



1. A method for restoring after detector fabrication high radiant energy sensitivity in crystalline extrinsic detector material doped with dopant atoms to provide a predetermined energy level located between the valence and conduction band of the detector material comprising the steps of:

forming a layer having a damaged crystalline lattice structure in said detector material and raising the temperature of said detector material above 900° C. for a period of time to allow impurity atoms of a first type which diffuse readily throughout said detector material at times said material is above 900° C. to be trapped by said damaged crystalline lattice structure to enhance the majority carrier lifetime of the detector material whereby the number of ionized dopant atoms is reduced.

4,416,052

METHOD OF MAKING A THIN-FILM SOLAR CELL

Theodore G. Stern, San Diego, Calif., assignor to General Dynamics, Convair Division, San Diego, Calif.

Filed Mar. 29, 1982, Ser. No. 363,195
Int. Cl.³ H01L *31/06, 31/18*
U.S. Cl. 29—572 7 Claims

1. A method of forming a thin gallium arsenide solar cell of improved efficiency, which comprises the steps of:

providing a self-supporting photovoltaic cell comprising gallium arsenide having a thickness of at least about 250 micrometers;

forming a pattern of contact lines across the front surface of said photovoltaic cell and a bus bar contact along one edge of said front surface;

bonding a thin visible-light transparent coverslide to said front surface;

initially etching the back surface of said photovoltaic cell to uniformly reduce the thickness of said photovoltaic cell to a minimum useful thickness;

applying a stop-etch material to said back surface except in the area corresponding to said bus;

further etching said back surface down to said bus;

removing said stop-etch material, and

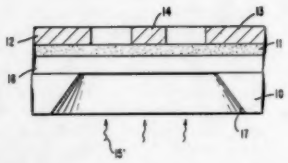
applying a light reflective electrically conductive material to the surface protected by said stop-etch.

4,416,053

METHOD OF FABRICATING GALLIUM ARSENIDE BURRIS FET STRUCTURE FOR OPTICAL DETECTION

Luis Figueroa, Woodland Hills, and Huan-Wun Yen, Westlake Village, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Division of Ser. No. 133,183, Mar. 24, 1980, Pat. No. 4,346,394.
This application May 17, 1982, Ser. No. 379,522
Int. Cl.³ H01L *21/283, 21/308*
U.S. Cl. 29—572 **11 Claims**



1. A process for fabricating an integrated optical photodetector on a substrate of semi-insulating III-V semiconductor material comprising:

(a) forming an undoped buffer layer of mixed III-V semiconductor material on at least a portion of said substrate, said buffer layer having an indirect bandgap;

(b) forming at least one opening in said substrate to expose at least one portion of said buffer layer; and

(c) forming at least one detector on said buffer layer operably associated with at least one opening by a process including:

(i) forming an active region of III-V semiconductor material on said buffer layer, said buffer layer having an indirect bandgap, the value of which is larger than that of said active region, and

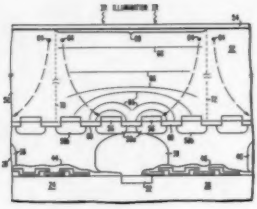
(ii) forming a pair of electrodes in contact with said active region.

4,416,054

METHOD OF BATCH-FABRICATING FLIP-CHIP BONDED DUAL INTEGRATED CIRCUIT ARRAYS

Richard N. Thomas, Franklin Borough, and Michael M. Sopira, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 165,158, Jul. 1, 1980, Pat. No. 4,369,458.
This application Sep. 29, 1982, Ser. No. 427,333
Int. Cl.³ H01L *21/28*
U.S. Cl. 29—572 **8 Claims**



1. A method of batch-fabricating a plurality of high-density flip-chip bonded dual integrated circuit arrays comprising the steps of:

fabricating a first integrated circuit for signal processing having a first array of electrical signal storage cells with an injection region and a metallic cell contact disposed at each cell;

fabricating a second integrated circuit for radiation detection having a substrate with a first side conditioned for accepting a radiation image thereon, and a second side, opposite said first side, including a second array of metallic detector contacts disposed on the surface thereof, said second array being fabricated with a greater density of contacts than said first array for substantially equal surface areas, each metallic detector contact being fabricated of a physical size which is smaller than said metallic cell contacts;

bonding each metallic cell contact of said first integrated circuit to a corresponding group of metallic detector contacts of said second integrated circuit to render a dual integrated circuit flip-chip configuration; and

dividing the bonded dual integrated circuit flip-chip configuration into a plurality of high-density dual integrated circuit flip-chip bonded predetermined arrays.

4,416,055

METHOD OF FABRICATING A MONOLITHIC INTEGRATED CIRCUIT STRUCTURE

Jeremiah P. McCarthy, Framingham, and Marvin Tabasky, Peabody, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 4, 1981, Ser. No. 327,383
Int. Cl.³ H01L *21/31, 21/318*
U.S. Cl. 29—577 C **16 Claims**

1. The method of fabricating monolithic integrated circuit structure incorporating a bipolar transistor and a resistor comprising:

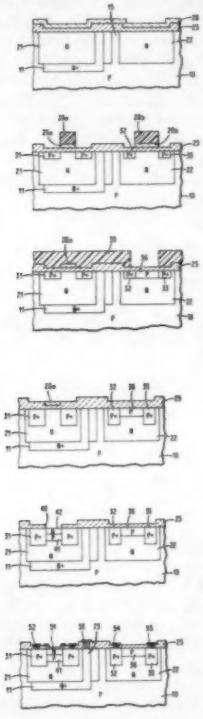
providing a body of semiconductor material including a first section having semiconductor material of one conductivity type encircling a first sector of the opposite conductivity type inset at a surface of the body and a second section having semiconductor material of the one conductivity type encircling a second sector of the opposite conductivity type inset at the surface of the body;

forming an adherent layer of a first protective material on said surface, the portion of said layer overlying a predetermined part of said first sector being thinner than the portion of said layer overlying the remainder of said first section, and the portion of said layer overlying a predeter-

mined part of said second sector being thinner than the portion of said layer overlying the remainder of said second section;

forming an adherent layer of a second protective material on the thinner portion of said layer of the first protective material overlying a predetermined zone within said part of said first sector, and forming a adherent layer of the second protective material on the thinner portion of said layer of the first protective material overlying a predetermined zone within said part of said second sector;

introducing conductivity type imparting material of the one conductivity type into said part of said first sector other than said predetermined zone protected by said second protective material, the thicker portion of the layer of the first protective material protecting the remainder of the first section, to form a region of the one conductivity type of low resistivity within said first sector; and simultaneously introducing conductivity type imparting material of the one conductivity type into said part of said second sector other than said predetermined zone protected by said second protective material, the thicker portion of the layer of first protective material protecting the remainder of the second section, to form first and second regions of the one conductivity type of low resistivity within said second sector;



removing the layer of the second protective material overlying said predetermined zone of said part of said second sector;

introducing conductivity type imparting material of the one conductivity type into the predetermined zone of said part of said second sector to form a region of the one conductivity type of high resistivity extending between said first and second regions of the one conductivity type of low resistivity;

increasing the thickness of the layer of the first protective material except for the portion thereof underlying the layer of the second protective material which overlies said predetermined zone of said part of said first sector by treating the body of semiconductor material in the presence of a material to convert semiconductor material underlying the first protective material to first protective material of the layer, said second protective material preventing conversion of the underlying semiconductor material of said predetermined zone of said part of said first sector;

removing the layer of the second protective material overlying said predetermined zone of said part of said first sector;

reducing the thickness of the layer of the first protective material sufficiently to form an opening in the layer of the first protective material exposing the surface of said predetermined zone while leaving a layer of the first protective material overlying the remainder of said first section and said second section; and

introducing conductivity type imparting material of the one conductivity type into a first portion and conductivity type imparting material of the opposite conductivity type into a second portion of said predetermined zone as delineated by said opening, said second portion being located between said first portion and said surface

whereby said second portion of said predetermined zone provides the active emitter region, said first portion of said predetermined zone provides the active base region, the portion of said first sector of the opposite conductivity type adjacent to said first portion of said predetermined zone provides the active collector region, and said region of the one conductivity type of low resistivity provides a base contact region of a bipolar transistor in said first section; and said region of the one conductivity type of high resistivity provides a resistor, and said first and second regions of the one conductivity type of low resistivity provide resistor contact regions of a resistor within said second section.

4,416,056

PROCESS FOR PREPARATION OF FILM COILS

Yoshio Takahashi, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

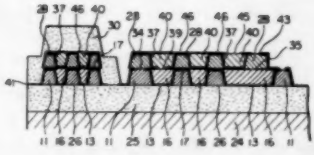
PCT No. PCT/JP78/00049, § 371 Date Aug. 13, 1979, § 102(e) Date Aug. 3, 1979, PCT Pub. No. WO79/00383, PCT Pub. Date Jun. 28, 1979

PCT Filed Dec. 12, 1978, Ser. No. 154,402

Claims priority, application Japan, Dec. 13, 1977, 52-149548; Dec. 13, 1977, 52-149549; Dec. 13, 1977, 52-149551

Int. Cl.³ G11B *5/42*; H01F *41/04*

U.S. Cl. 29—603 **4 Claims**



1. A process for the preparation of thin-film coils, which comprises: forming a first plane coil layer having a flat top face by arranging a plurality of first spiral conductor patterns wound in the same direction, each of said first conductor patterns being positioned on the same plane adjacent to one another and being insulated from one another; forming an insulating layer on said first plane coil layer, said insulating layer having a plurality of selectively positioned apertures therein such that each of said conductor patterns is exposed by at least one aperture; and forming and laminating on said insu-

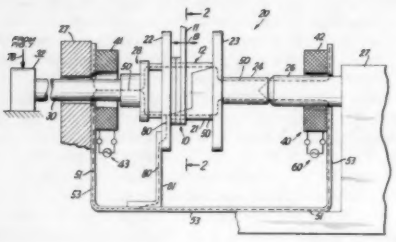
lating layer a second plane coil layer which overlaps some of said plurality of apertures by arranging a plurality of second spiral conductor patterns wound in a direction opposite to that of said plurality of first spiral conductor patterns of the first plane coil layer, each of said second conductor patterns being positioned on the same plane adjacent to one another and being insulated from one another, the conductor patterns in the first plane coil layer being directly connected through said apertures to the conductor patterns in the second plane coil layer alternatively to form one coil comprising all of said conductor patterns thus directly connected in series.

4,416,057

METHODS OF TESTING THE INTEGRITY OF AN ELECTRICAL COIL AS IT IS WOUND

John Tardy, Somerville, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed May 28, 1981, Ser. No. 267,980
Int. Cl.³ H01F *7/18*
U.S. Cl. 29—605 **5 Claims**



1. A method of testing the integrity of an electrical coil including turns of an insulated wire, which comprises:

(a) applying an A.C. input signal to a first test winding positioned opposite to a second test winding and magnetically coupling said first test winding to said second test winding by magnetic flux directed through a magnetic flux path so that an A.C. output signal is induced in the second test winding having a first electrical characteristic; and

(b) winding turns of said wire of said electrical coil about said magnetic flux path while monitoring said A.C. output signal for a change in the output signal characteristic from said first electrical characteristic to a different characteristic, such change being indicative of eddy currents in wound turns of wire of said electrical coil to provide an indication whether the turns being wound are shorted.

4,416,058

APPARATUS FOR WINDING COILS AND INSERTING COILS AND WEDGES INTO STATOR CORES

John J. Henry, Sr., and Buddy S. Stuckey, both of Fort Wayne, Ind., assignors to Essex Group Incorporated, Ft. Wayne, Ind.

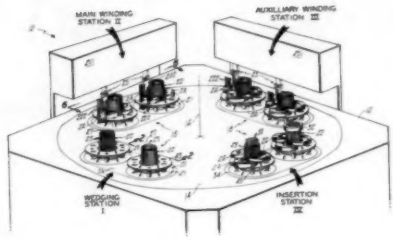
Filed Dec. 17, 1981, Ser. No. 331,848
Int. Cl.³ H02K *15/06*
U.S. Cl. 29—734 **11 Claims**

1. Apparatus for forming dynamoelectric field windings and for inserting the windings into slots between the teeth of a stator core comprising:

transfer tool means comprising wall means defining a tool bore having an axis, said wall means forming a plurality of axially extending wedge holding slots circumferentially spaced about the tool bore axis for temporarily holding wedges for subsequent insertion into a stator core, said wall means also including a plurality of axially extending wedge guide blades circumferentially disposed about the tool bore axis and equal in number to the number of wedge holding slots, each wedge guide blade having a pair of oppositely and circumferentially facing, axially extending channels formed therein, each channel facing a corresponding axially extending channel in the wedge guide blade adjacent thereto, each pair of corresponding facing channels defining a wedge guide slot extending in vertical alignment with one of said wedge holding slots, each pair of adjacent wedge guide blades also defining a vertical wire receiving space therebetween extending the length of said wedge guide blades, said blades each having a base adjacent said wedge holding slots and a tip spaced furthest from said wedge holding slots;

means for inserting wedges into said wedge holding slots;

wire winding means including nozzle means having a wire dispensing end, and means for moving said wire dispensing end in a plane over said guide blade tips in a plurality of concentric circular paths of predetermined radii, said paths having an axis outside said tool bore and parallel to said tool bore axis, said winding means constructed and arranged to push wire from said dispensing end forming multiple circular turns of each of said plurality of predetermined radii, wherein said wedge guide blades are constructed and arranged such that the turns of each different predetermined radii fall by gravity into and down through a different predetermined pair of wire receiving spaces without interference from said wedge guide blades and accumulate to form substantially cylindrical, concentric dynamoelectric field windings on said transfer tool means;



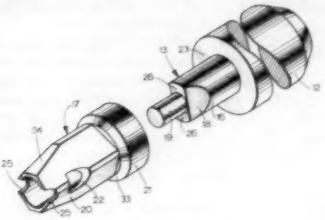
inserter means including a plurality of elongated, axially extending, circumferentially disposed, spaced apart finger elements equal in number to said wedge guide blades, each element having a radially outwardly facing axially extending surface, and means for moving said elements vertically upwardly within said tool bore after the field windings have been formed on said transfer tool means such that each of said elements is aligned with and has its said outwardly facing surface abutting one of said wedge guide blades and the spaces between adjacent finger elements are aligned with the said wire receiving spaces, each of said finger elements including a top portion for extending above said tips of said wedge guide blades and aligning radially with and engaging the teeth of a stator core, said inserter means also including stripper means for moving upwardly within said bore of said transfer tool means and within the bore of a stator core disposed on said finger elements to push said field windings upwardly along the spaces between said guide blades and finger elements and over said top portion of said finger elements into the slots of the stator core, said inserter means also including pusher means for pushing wedges from said wedge holding slots along said wedge guide slots into the stator core slots over field windings as the windings are being inserted into the stator core slots, said means for moving said elements including means for retracting said elements from within said tool bore.

4,416,059

WIRE INSERTION TOOL

John W. Humphrey, Eden Prairie, and Raymond A. Silbernagel, Ramsey, both of Minn., assignors to Magnetic Controls Company, Minneapolis, Minn.

Filed Dec. 18, 1981, Ser. No. 332,179
Int. Cl.³ B23P *19/02*
U.S. Cl. 29—751 **15 Claims**



1. A wire insertion tool usable for inserting a wire into a split cylinder connector comprising:

a forward rod portion having a longitudinal axis and a forward end for engagement with said wire, said wire being generally perpendicular to the longitudinal axis of said forward rod portion;

a hollow sleeve portion having a longitudinal axis generally parallel to the longitudinal axis of said forward rod portion, a side wall surrounding said forward rod portion and an elongated bore extending through at least a portion of said sleeve portion, said bore being spaced radially outwardly from said forward rod portion to define a generally annular space therebetween for receiving a portion of said split cylinder connector, said sleeve portion extending forward beyond the forward end of said forward rod portion,

a pair of wire engaging notches disposed in the forwardmost end of said hollow sleeve portion and on opposite sides thereof for engaging and aligning said wire, the rearwardmost portion of each of said notches for engaging with the wire during said inserting; and

at least a pair of closed loop openings disposed rearwardly of said forward end of said forward rod portion, said openings extending through said side wall and communicating with said bore for the purpose of removing wire scraps and the like which are generated during the insertion procedure.

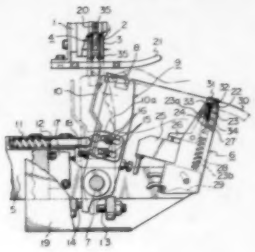
4,416,060

SLIDE FASTENER FINISHING MACHINE

Toshiaki Nakagawa, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 21, 1981, Ser. No. 265,784
Claims priority, application Japan, Jun. 4, 1980, 55-75063
Int. Cl.³ A41H *37/06;* **B21D** *53/50*
U.S. Cl. 29—767 **5 Claims**

1. A slide fastener finishing machine for applying a bottom stop to a slide fastener chain comprising an upper frame, a bottom stop fastening head mounted on said upper frame for vertical movement and having a punch, a lower frame, a slider holding jig fixedly secured to said lower frame and offset from the position right below said punch for an operator to thread said slide fastener chain, with his fingertips grasping said slide fastener chain, through said slider holding jig, a die holder mounted on said lower frame between said position right below the punch and said slider holding jig, said die holder having a die on the top thereof and being movable to a first position in which said die is aligned with said punch from a second position, to which said die holder is normally biased by biasing means, in which the die is offset from the punch, pusher plate means secured to and extending from said die holder to be pushed by the back of the hands of the operator as one end of said slide fastener chain threaded through said slider holding jig overlies said die holder to position said die holder directly beneath said punch such that the fingertips of said operator



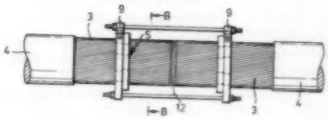
continuously grip the slide fastener chain during threading through said slider holding jig and application of said bottom stop.

4,416,061

METHOD FOR JOINTING CABLES

Lars Aanerud, Blystadlia, and Georg Balog, Tranby, both of Norway, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,755
Claims priority, application Norway, Aug. 26, 1980, 802529
Int. Cl.³ H01B *13/20*
U.S. Cl. 29—828 **7 Claims**



1. A method for jointing cables, each cable having a core and at least one layer of longitudinal armouring elements surrounding the core, comprising:

cutting the armouring elements of each cable to a predetermined jointing position;

mounting a circumferential bracket onto the elements of each of the cables to be jointed at a predetermined distance from the jointing position;

individually securing each of the armouring elements to the circumferential bracket;

lifting the armouring elements away from the ends of the cables;

jointing the cable cores;

repositing the armouring elements;

stretching the armouring elements of each cable towards the armouring elements of the other cable so that they will overlap;

cutting the overlapped portion of the armouring elements;

jointing the armouring elements of the jointed cables; and

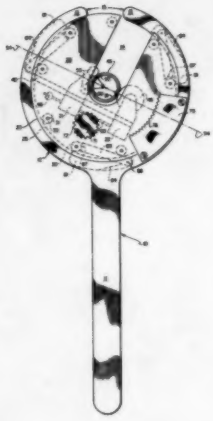
removing the circumferential bracket thereby releasing the secured armoured elements.

4,416,062

SELF CENTERING PIPE CUTTING DEVICE

John R. Cummings, 3687 S. 2200 West, West Valley City, Utah 84119

Filed Aug. 13, 1981, Ser. No. 292,641
Int. Cl.[3] B23D *21/08*
U.S. Cl. 30—101 8 Claims



1. A self centering pipe cutting device comprising:

a handle assembly including (i) a handle section configured in length and size to fit within small areas where working access to a pipe is otherwise limited, and (ii) a cutter support frame affixed to one end of said handle and configured to partially circumscribe a pipe cutting area, said frame including a gap having a width sufficient to permit passage of a section of pipe therethrough;

a pair of cutter guide plates rotatably positioned on opposing sides of said support frame and including means for coupling the respective plates into fixed, substantially parallel orientation with respect to each other, said cutter guide plates each having an elongate opening in size equal to the frame gap width and extending in common alignment from a central location of each plate through its perimeter to provide access means for insertion of a pipe to the central location of the guide plates;

a pair of linear track guides respectively formed along the interior faces of the guide plates and in parallel orientation, said track guides being located toward the center of each plate and across a plate section uninterrupted by said elongate openings;

a cutter assembly including a tracking body with upper and lower tracking means configured to travel said respective linear track guides on the opposing inner faces of the cutter guide plates, said cutter assembly further comprising a cutting tool mounted at an edge of the cutter assembly toward the center of the guide plates when in tracking position, and in an orientation adapted for contracting and cutting an external circumferential path around an inserted pipe;

a roller support assembly including a tracking body with upper and lower tracking means configured to travel said respective linear track guides on the opposing inner faces of said guide plates, said roller assembly further comprising a pair of support rollers rotatably mounted at an edge of the roller assembly toward the center of the guide plates in opposing orientation to the cutting tool such that a line parallel to said linear track guides and passing through the point of projected cutting contact of said cutting tool also passes midway between the pair of support rollers;

adjustment means coupled to the cutter assembly at one end and the roller assembly at the other end and having rotational drive means attached to the cutter support frame as opposed to the handle section and adapted for adjustment operation by mere rotation of the handle assembly about the pipe cutting area to simultaneously move the cutter and roller assemblies in converging or diverging direction, depending on the direction of force applied to the drive means, said converging and diverging directions being parallel with said parallel line passing through the cutter tool and midsection of the roller pair; and

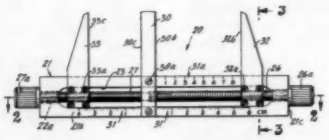
ratchet and pawl means coupled between the cutter support frame and rotatable guide plates, said ratchet and pawl means being operable to actuate rotational movement of the guide plates and attached cutter and roller assemblies when the handle assembly is rotated in one direction, without counter guide plate rotation upon reverse directional movement of the handle assembly.

4,416,063

GOLDEN PROPORTION CALIPERS

Jack Nestor, 110 1st Ter., Miami Beach, Fla. 33139, and William A. Shoemaker, Jr., 6860 SW. 96th St., Miami, Fla. 33156

Filed Mar. 2, 1982, Ser. No. 353,960
Int. Cl.[3] G01B *5/14*
U.S. Cl. 33—163 16 Claims



1. A proportional divider comprising an elongated holder having a longitudinal bore formed with a centralized enlargement providing a track, a rotatable spindle extending through said bore and projecting from said holder at, at least, one end thereof, a terminal knob mounted on said projecting spindle end for manually rotating said spindle, said spindle having two threaded portions, each extending from a midportion of the spindle toward opposite ends thereof, the threads of said portions being reversed with respect to each other and being differently pitched in a ratio approximating 1 to 0.618, threaded means mounted in said track and engaging each of said spindle portions, said holder having a front face onto which said track opens along the length thereof, a reference index including a pointer mounted on said holder front face to extent perpendicularly to the axis of the spindle in a fixed predetermined relation with respect to said spindle midportion, each of said threaded means having a front surface extending into said track front face opening for guided displacement of these along said opening, and a pair of movable indices, each being mounted on one of said threaded means front surfaces and including a pointer disposed perpendicularly to said spindle for movement in said ratio toward and away from said reference pointer on manual axial rotation of said spindle by said knob.

4,416,064

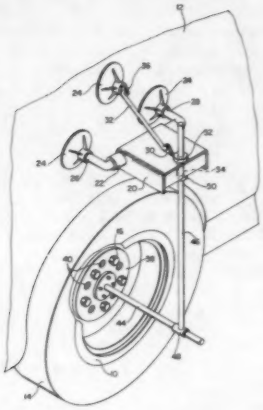
LADDER BAR DIAL

Roger W. Hurst, Box 124, Hartford, Ky. 42347

Filed Jun. 30, 1982, Ser. No. 394,004
Int. Cl.[3] G01B *5/00*
U.S. Cl. 33—181 AT 6 Claims

1. An auxiliary device for determining a requirement for rear suspension adjustments of a racing vehicle comprising a main body, means for mounting said main body to a body portion of said racing vehicle, with said main body in substantially a horizontal plane, a first rod means for securing said first rod on the center line of a wheel with said first rod substantially

perpendicular to a vertical plane through said wheel, a second rod, a bearing-coupling on one end of said second rod, said bearing-coupling adapted to be placed over and along said first



rod, said second rod having sufficient length to extend through an aperture in said main body when in use, and a pair of locator means, said pair of locator means having an axial aperture which will slip over said second rod with a frictional fit.

4,416,065

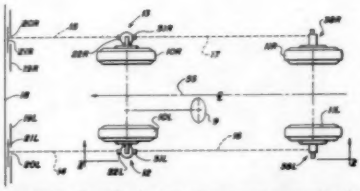
METHOD OF AND APPARATUS FOR ALIGNING VEHICLE FRONT AND REAR WHEELS

Lee Hunter, 13501 Ladue Rd., Creve Coeur, Mo. 63141

Filed Jan. 29, 1982, Ser. No. 343,825

Int. Cl.³ G01B *7/315*

U.S. Cl. 33—203.15 **13 Claims**



1. In apparatus for aligning the front and rear wheels of a vehicle relative to the geometric center line of the vehicle, the combination of:

means carried by the front wheels of the vehicle for projecting light beams forwardly and for projecting other light beams rearwardly toward the rear wheels;

reticles in said other light beam projecting means forming a pattern which includes horizontally positioned scales and images representing zero positions on the horizontal scales;

means carried by the rear wheels of the vehicle in position presenting targets for the reticle formed patterns projected rearwardly by said other light beam projectors, said targets including horizontal scales for cooperation with said vertically positioned index lines of said reticles and reflective surfaces for cooperation with said horizontally positioned scales of said reticles to reflect the horizontal scales toward the front wheels; and

target screens carried by said front wheels in rearwardly facing positions for receiving the horizontally positioned scales as reflected from said reflective surfaces carried by said rear wheels, said target screens presenting vertically oriented index lines for cooperation with said reflected horizontally positioned reticle scales and vertically positioned index lines.

4,416,066

ARRANGEMENT FOR ORIENTATION DURING JOURNEYS IN LAND VEHICLES

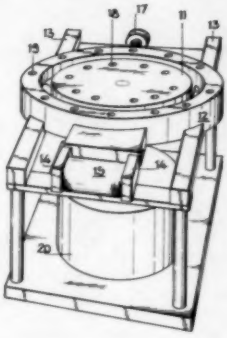
Bertold Romacker, Esslingen, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Sep. 11, 1980, Ser. No. 186,252

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936774

Int. Cl.³ G01C *22/00, 23/00, 19/00*

U.S. Cl. 33—318 **32 Claims**



1. An arrangement mounted on a land vehicle for the purpose of orientation on journeys of the land vehicle comprising, in combination:

first means for ascertaining the distance traveled by the vehicle;

second means for ascertaining changes in direction of the vehicle, said second means including a direction indicator for determining changes in direction of the vehicle with said direction indicator being rigidly connected to said vehicle, and an inertial mass mounted in said vehicle to be substantially friction free so that it does not perform the changes in vehicle direction with the vehicle, said mass being disposed in said vehicle such that said direction indicator carries out rotary movements about the mass as the vehicle changes direction, with these rotary movements being a measure of the changes in vehicle direction; and,

third means, responsive to output signals from said first and second means, for indicating the path traveled, including distance and changes of direction, and the current location of the vehicle, said third means including fourth means for supporting a map and for rotating the map corresponding to direction changes of the vehicle so as to always indicate the true heading and location of the vehicle on the map.

4,416,067

CORRECTION METHOD AND DEVICE FOR A MAGNETIC FIELD PROBE

Hartmut Scherer, and Peer Thilo, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 13, 1982, Ser. No. 378,020

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1981, 3123180

Int. Cl.³ G01C *17/38*

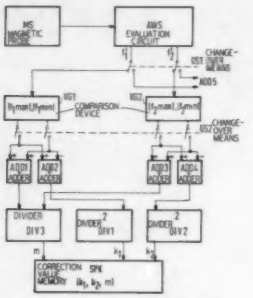
U.S. Cl. 33—356 **8 Claims**

1. A correction system for a magnetic field probe which

measures an external magnetic field in terms of magnitude and direction, and wherein the probe is moved in a circle before a beginning of the measurement, comprising:

means for determining maximum and minimum values of a magnetic field vector relative to the probe by continuous measurement of said magnetic field vector during the circular movement;

means for forming a correction vector from a halved vector sum of said maximum and minimum values;



means for vectorally adding the correction vector to the respective measured values of the probe during the continuous measurement;

the magnetic field probe being followed by an evaluation circuit whose output is selectively connected over a changeover means to a calibration means or to a measuring unit having a display device connected thereto;

and a correction value memory being provided whose input is connected to the calibration means and its output is connected to the measuring unit.

4,416,068

APPARATUS FOR SURFACE TREATMENT OF OBJECTS

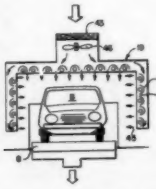
Hans E. Nilsson, Henan, and Ake Carlsson, Trollhättan, both of Sweden, assignors to Infrarodteknik AB, Vanersborg, Sweden

Filed Dec. 3, 1981, Ser. No. 327,232

Claims priority, application Sweden, Dec. 11, 1980, 8008707; Feb. 27, 1981, 8101282

Int. Cl.³ F26B *23/04*

U.S. Cl. 34—4 **16 Claims**



1. Apparatus for surface treatment in a booth adapted for application of a surface treatment material to a body comprising:

a traversable carrier in said booth containing means for controlled energy transfer to said body;

said means in said carrier being in groups, with at least one element in each group, each group having a separate energy supply;

flow means adjacent said energy-transfer means to direct ventilating medium from said carrier toward said body;

means to position said body at a predetermined work area in said booth;

a parking area for receiving said carrier when not in use;

means to drive said carrier from said parking area to traverse said work area and return said carrier to said parking area;

ventilating means to supply ventilating medium to said carrier and to exhaust spent ventilating medium from said booth; and

control means to actuate said drive means and to operate said separate energy supplies to supply heat to a selected area of said body during said traverse, in a way that is specific to the treating material used, the specific part of the body and the specific body.

4,416,069

ENHANCEMENT OF COLOR QUALITY OF LUMBER DURING DRYING

Howard N. Rosen; Robert E. Bodkin, both of Carbondale, and Kenneth D. Gaddis, Johnston City, all of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 246,971, Mar. 24, 1981, Pat. No. 4,343,095. This application Aug. 19, 1981, Ser. No. 294,096

Int. Cl.³ F26B *7/00*

U.S. Cl. 34—13.8 **9 Claims**

1. A process for simultaneously drying and darkening lumber throughout its thickness by subjecting the lumber to steam generated by the drying wood in the absence of air at temperatures from 215° to 320° F. and pressures from 15 to 40 psi.

4,416,070

AIR-DIRECTING DEVICE FOR MULTIPLE CYLINDER DRYER OF PAPER MACHINE

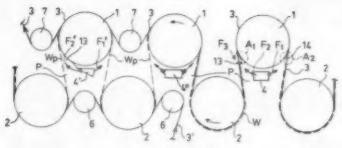
Timo Vedenpää, Jyväskylä; Yngve Lindström; Pekka Eskelinen, both of Turku, and Jorma Kotanen, Jyväskylä, all of Finland, assignors to Valmet Oy, Finland

Filed Nov. 24, 1981, Ser. No. 324,861

Claims priority, application Finland, Dec. 1, 1980, 803721

Int. Cl.³ F26B *13/08*

U.S. Cl. 34—114 **2 Claims**



1. An air-directing device for a multiple cylinder dryer of a paper machine, said multiple cylinder dryer having a plurality of cylinders and a paper web passing over the cylinders, said device comprising

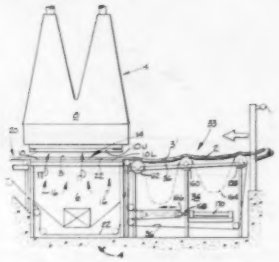
air-supplying means for supplying and directing air to said multiple cylinder dryer, said air-supplying means including air-blowing members for blowing air, said air-supplying means being so placed and said air-blowing members being so disposed and directed that the air blown out from said members is directed into the clefts defined by the surface of the drying cylinder and the paper web thereby producing a pressure effect in said clefts, each of said air-blowing members comprising a doctor having a doctor beam for conducting and directing air, said doctor beam having a surface, air-blowing apertures formed through said surface and a Coanda guide baffle having a leading edge affixed to said surface of said doctor beam next-adjacent said apertures and a spaced opposite trailing edge affixed to said surface in spaced relation with said apertures in a manner whereby said Coanda guide baffle is free from said apertures but directs air from said apertures into said clefts.

4,416,071

APPARATUS FOR RAPID ANNEALING OF REFRACTORY FIBER BODIES

Richard N. Cunningham, Jefferson County, Colo., and Romain E. Loeffler, deceased, late of Jefferson County, Colo. (by Carolyn R. Loeffler, personal representative), assignors to Manville Service Corporation, Denver, Colo.

Division of Ser. No. 73,412, Sep. 7, 1979, Pat. No. 4,294,878.
This application May 18, 1981, Ser. No. 264,745
Int. Cl.³ F26B *13/00*
U.S. Cl. 34—155 **16 Claims**



1. Apparatus for the annealing of a body of refractory fiber according to a process comprising passing air at a temperature in the range from about 750° F. to about 1400° F. through said body for a period of from about 5 to about 200 seconds while maintaining said body with a predetermined dimension in the direction of air flow, which apparatus comprises:

(a) a pair of parallel opposed foraminous platens;

(b) means for moving at least one of said platens in a direction normal to the other while maintaining the platens parallel to each other;

(c) means for passing heated air through and from one platen to and through the other platen; and

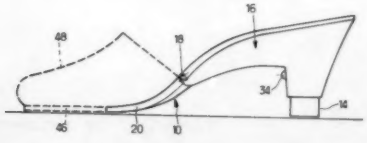
(d) means for intermittently inserting segments of said body seriatim into the space between said platens and retaining each of said segments in said space for said period of 5 to 200 seconds with the opposed faces of said platens being in contact with the surfaces of said segments and spaced apart at a predetermined distance, such that said heated air passed from one platen to the other also passes through the segment located between said platens and thereby anneals said segment.

4,416,072

HEEL AND SOLE ASSEMBLY FOR AN ADJUSTABLE ARCH SHOE

Vahe Sarkissian, Paris, France, assignor to Touchwood International S.A., Geneva, France

Filed Sep. 22, 1981, Ser. No. 304,573
Claims priority, application France, Oct. 9, 1980, 80 21611
Int. Cl.³ A43B *3/24, 13/28, 21/36*
U.S. Cl. 36—100 **2 Claims**



1. A heel and sole assembly for an adjustable arch shoe of the type comprising a fixed support element having a heel portion and a sole portion, a pivoting element positioned above the rear part of the fixed support element and in spaced relation to said rear part so that it can be raised or lowered in relation to said fixed support element; manually operable locking means to lock the pivoting element in the position corresponding to the height chosen for the heel, and prestressed spring means positioned between the fixed support element and the pivoting element to force the latter upwards, characterized in that the pivoting element comprises a hollow structure heel body covering the heel portion of the fixed support with sufficient clearance that said hollow structure heel body can freely slide along said heel when said pivoting element rotates, and a sole body articulated upon said fixed support element on a level with the zone of inflection of the sole's arch, said locking means being made up of a single axially slidable pin mounted against the force of a spring, said spring positioned within a horizontally recessed opening formed in the internal vertical face of the heel portion of the fixed support element, the external end of said pin protruding through one of several openings formed on the internal face of said hollow structure heel body.

4,416,073

WATER-BORNE INFLATABLE PROMOTIONAL DEVICE

Robert K. Vicino, and Mark S. Bachman, both of San Diego, Calif., assignors to Robert Keith & Co., Inc., San Diego, Calif.

Filed Apr. 5, 1982, Ser. No. 365,128
Int. Cl.³ G09F *19/00*
U.S. Cl. 40—326 **2 Claims**

1. A floating display comprising:

an inflatable envelope made of a plurality of fabric panels sewn together along permeable seams;

said panels being shaped and dimensioned so that the envelope when inflated assumes the enlarged shape of a product;

a blower mounted in one of said panels, said blower being directed to continuously introduce into said envelope a sufficient flow of ambient air to maintain said envelope inflated;

at least one pocket within said envelope;

ballast means within said pocket to keep said inflated envelope in a generally stable position when towed over a body of water;

a bailing tube in the lower portion of said envelope to evacuate fluid out of said envelope;

within said envelope, a plurality of anchoring patches attached at selected locatons to said sections;

a plurality of tethers, each having one end connected to one of said patches; the other ends of said tethers joining together to form a towing line;

said towing line exiting said envelope through an orifice in the envelope for attachment to a towing device.

4,416,074

RING VIEWER

Benjamin G. Guerrero, Los Angeles, and Saint Elmo B. Berford, Lakewood, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Sep. 29, 1982, Ser. No. 426,464
Int. Cl.³ G02B *27/02*
U.S. Cl. 40—364 **6 Claims**

6. A ring viewer comprising:

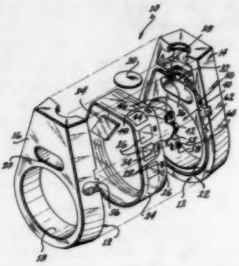
two molded housing halves permanently welded together to form a ring housing;

a finger opening formed in said housing adapted to accommodate the finger of a wearer;

a track formed internally of said housing between said housing halves and surrounding said finger opening;

an endless strip of film having a number of frames and corresponding perforations thereon moveably captured in said track;

a light aperture formed in said housing, said light aperture extending entirely through one of said housing halves and being closed by a wall in said other housing half;



a mirror mounted at a preselected angle in said light aperture to reflect light received from a light source;

a lens captured between said housing halves and aligned with said mirror;

two film openings formed in said housing in alignment with said lens and said mirror on either side of said track to allow said light reflected by said mirror to pass through a frame of said film to be seen by a viewer on said lens; and

a unitary film advance mechanism held in said ring adjacent said film including means to move said film a frame at a time upon application of pressure thereto.

4,416,075

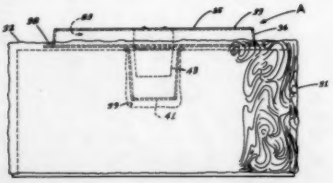
ILLUMINATED CAKE DECORATION

Ronald E. Bauer, 2215 Dawes, Overland, Mo. 63114

Filed Oct. 28, 1981, Ser. No. 315,959

Int. Cl.³ G09F *19/00*

U.S. Cl. 40—546 **19 Claims**



1. A food product decorating accessory for providing illuminated decoration on the surface of a cake or other similarly decoratable food product; said accessory including a decorative cover plate for being applied externally to and upon said surface of said cake; said cover plate overlying at least a portion of said surface of said cake; said cover plate having at least one portion thereof to allow for the transmission of light through said cover plate; illumination means being located below said cover plate for providing a light source visible through said light-transmissive portion of said cover plate when viewed from above said cover plate by an observer of said cake.

4,416,076

DEVICE FOR RETAINING CARTRIDGES IN THE MAGAZINE OF A SEMI-AUTOMATIC SHOTGUN DURING A REPLACEMENT OF THE CARTRIDGE IN THE FIRING CHAMBER

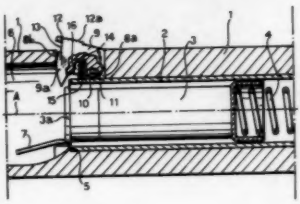
Leonardo Ottolini, Brescia, Italy, assignor to Luigi Franchi S.p.A., Fornaci, Italy

Filed Dec. 28, 1981, Ser. No. 335,032

Claims priority, application Italy, Jan. 23, 1981, 20556 E/81

Int. Cl.³ F41C *25/08*

U.S. Cl. 42—17 **2 Claims**



1. In a semi-automatic shotgun including an elongate tubular cartridge magazine with an open end through which cartridges are discharged to the firing chamber of the shotgun, a device for retaining the cartridges in the magazine during replacement of a cartridge in the firing chamber, comprising:

a fixed pin extending perpendicular to the longitudinal axis of the magazine;

a lever having a portion accessible from outside the gun, and a hooked portion within the gun;

means for pivotally coupling the lever to the pin, said coupling being loose in the direction of the longitudinal axis of the magazine, whereby the lever is angularly displaceable about the pin from a first position, in which said hooked portion is spaced from the open end of the magazine, to a second position, in which said hooked portion extends transverse the open end of the magazine, so as to constitute a stop for the cartridges therein;

a spring for resisting displacement of the lever from the first position to the second position, and

means for releasable locking of the lever in the second position.

4,416,077

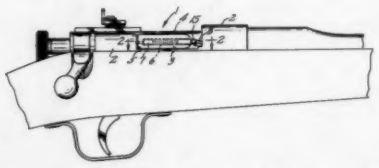
COMBINATION EXTRACTOR AND HOLD DOWN MECHANISM FOR A BOLT-ACTION RIFLE

James G. Thompson, 4655 Butte Falls Hwy., Eagle Point, Oreg. 97524

Filed Jun. 14, 1982, Ser. No. 388,272

Int. Cl.³ F41C *15/00, 11/06*

U.S. Cl. 42—25 **6 Claims**



4. A bolt assembly for a bolt-action rifle, said assembly including,

a bolt main body member including a locking lug defining a bore,

a hold down plunger slidably mounted within said locking lug,

an extractor pin also slidably mounted within said locking lug,

resilient means biasing said hold down plunger and said extractor pin in opposite directions, and

an extractor movably mounted adjacent one end of said bolt main body member, said extractor pin in biased engagement with said extractor for urging same into engagement with the rim of a cartridge casing for withdrawing of the cartridge casing from a rifle barrel chamber.

4,416,078

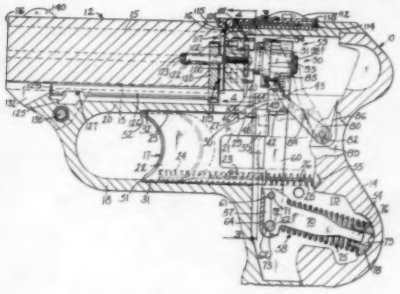
HANDGUN

Robert L. Hillberg, Cheshire, Conn., assignor to COP, Inc., Torrance, Calif.

Division of Ser. No. 111,870, Jan. 14, 1980, abandoned. This application Apr. 9, 1982, Ser. No. 367,114

Int. Cl.³ F41C *19/00*

U.S. Cl. 42—69 R **16 Claims**



1. A multi-barrel handgun comprising a frame, a barrel assembly including a plurality of barrels mounted on the frame, a breech block on the frame, a plurality of firing pins supported by the breech block, each of the firing pins aligned with an associated one of the barrels, a trigger supported on the frame for movement between ready and firing positions, a hammer pivotally supported on the frame, a sear mounted on the hammer and capable of being engaged by the trigger, means for pivoting the hammer toward the rear of the frame upon movement of the trigger toward its firing position and engagement of the trigger with the sear, means for releasing the sear from engagement with the trigger, a ratchet rotatably mounted on the hammer, a firing lug on the ratchet, pawl means for rotating the ratchet, and notch and detent means associated with said ratchet for rotating the ratchet to secure sequential alignment of the firing lug with each of the firing pins and including a plurality of notches symmetrically arranged around the axis of said ratchet and a detent member, the number of notches being equal to the number of barrels, each of said notches being adapted to receive said detent member and be engaged by said pawl means, and means for forcing the hammer forward upon release of the sear engagement so as to cause the striking of an associated firing pin by the firing lug.

4,416,079

FISHING APPARATUS

Vincent B. Hodshire, 2701 NE. Adams St., Peoria, Ill. 61603

Filed Jun. 7, 1982, Ser. No. 385,456

Int. Cl.³ A01K *97/01*

U.S. Cl. 43—15 **10 Claims**

1. A fishing apparatus comprising:

a main support member;

a first member connected to said main support and movable between first and second positions;

a trigger member connected to said first member,

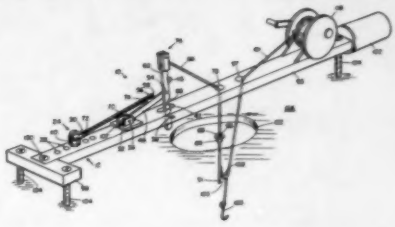
an extension connected to said trigger, said extension including a pair of spaced apart members having an axle extending therethrough;

means for retaining said trigger and said first member in said first position;

means for resiliently urging said trigger and said first member toward said second position;

a first guide in said main support;

a wire releasably connected to said axle and extending through said first guide;



first and second limiting means carried by said wire for limiting movement of said wire through said guide in response to said second limiting means engaging said first limiting means and said first limiting means engaging said main support member;

a reel mounted on said main support;

a second guide in said main support;

a fishing line extendably connected to said reel and extending through said second guide; and

means connected to said wire for releasably engaging said fishing line.

4,416,080

FISH LURE WITH AN OVERLAY

Lawrence E. Morrissette, 340 Bd des Ecoles, 83140 Six-Fours-Plage, France

Filed Oct. 26, 1981, Ser. No. 314,962

Int. Cl.³ A01K *85/00*

U.S. Cl. 43—42.2 **8 Claims**

1. A fish lure comprising:

(a) a main body of a tapered, fluted screw with a bore through its longitudinal axis;

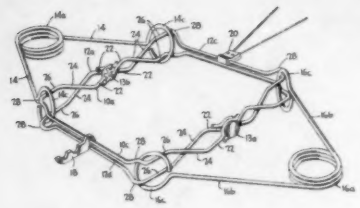
(b) a shaft extending through said bore;

(c) line connector means on said shaft on the narrow, forward end of said tapered screw;

(d) hook connector means on said shaft on the wide, rear end of said tapered screw; and

(e) an overlay secured to and extending longitudinally along said screw in spaced and unbalancing relation thereto, said overlay being constructed and arranged to cause said screw to be unbalanced and vibrate as it rotates about said shaft and to cause water to pass between said overlay and said screw as the lure is drawn through water.

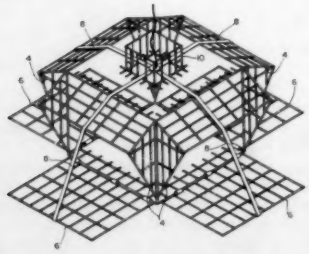
4,416,081
JAW CONFIGURATION FOR ANIMAL TRAP
William E. Askins, Lititz, Pa., assignor to Woodstream Corporation, Lititz, Pa.
Filed Feb. 23, 1982, Ser. No. 351,591
Int. Cl.³ A01M *23/26*
U.S. Cl. 43—90 **11 Claims**



1. In an animal trap of the type comprising two frames, each frame having a jaw-forming side and first and second end members extending from said jaw-forming sides, pivot means connecting the first end member of one frame to the second end member of the other of said frames, and connecting the second end member of said one frame to the first end member of the other frame for pivotal movement of said frames about a common axis between a set position, in which said jaw-forming side of said one frame is positioned remote from the jaw-forming side of the other frame, and a closed position in which said jaw-forming sides of said one and said other frames are positioned closely adjacent one another in opposite sides of an imaginary plane containing said common axis and residing between said jaw-forming sides in said closed position of said frames, actuator means for forcefully biasing said frames to rotate toward said closed position and trigger means for releasably maintaining said frames in said set position in opposition to said actuator means,

the improvement wherein said first and second end members of at least said one frame are configured to include an inner section extending generally radially outward from said common axis at an acute angle relative to said imaginary plane, a remote section extending generally inward from the jaw-forming side of said one frame and in parallel spaced relation to said imaginary plane when said frame members are in said closed position, and an intermediate section extending between the inner and remote sections.

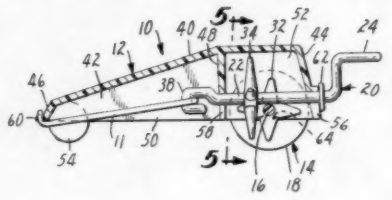
4,416,082
MARINE ANIMAL TRAP
Charles Strobel, 15 Parma Rd., Island Park, N.Y. 11558
Filed Feb. 16, 1982, Ser. No. 348,688
Int. Cl.³ A01K *69/10*
U.S. Cl. 43—102 **7 Claims**



1. A marine animal trap, consisting:

(a) a rectangular rod frame having edges defining a top, a base and four sides;
(b) a covering extending over the base of the frame;
(c) a wire mesh extending over the top of the frame;
(d) four wire mesh doors, each hinged to one of the four edges of the base of the frame;
(e) wire mesh outwardly converging extensions of the sides and top edges of the frame having edges defining closures with the wire mesh doors;
(f) means for baiting the trap; and
(g) cords extending from each of the doors and from the means for baiting to the top of the frame whereby the doors can be closed and the means for baiting lifted vertically during elevation of the trap.

4,416,083
MOLDABLE TOY VEHICLE
James F. Kubiatowicz, Fridley, Minn., assignor to Custom Concepts, Incorporated, Minneapolis, Minn.
Continuation of Ser. No. 212,546, Dec. 3, 1980, abandoned. This application Jul. 8, 1982, Ser. No. 396,153
Int. Cl.³ A63H *17/00*
U.S. Cl. 46—208 **5 Claims**



1. A toy vehicle consisting only of parts molded in finished form of a polymeric material in combination with a rubber band, said parts comprising:

a unitary integrally molded driven member comprising an axle having an axis, two wheels coaxial with and at opposite ends of said axle, and a star gear coaxially fixed on said axle between said wheels and having 4 to 6 radially projecting teeth disposed at generally equal angles about said axle;

a unitary integrally molded drive member comprising a drive shaft having an axis and first and second ends, winding means at said first end adapted to be manually engaged to rotate said drive shaft about its axis, a hook at an end of said drive shaft opposite said winding means receiving a length of said rubber band, and a star gear coaxially fixed on said drive shaft between said winding means and hook and having 4 to 6 radially projecting teeth disposed at generally equal angles about said drive shaft; and

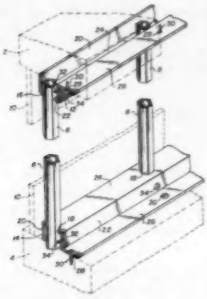
a unitary integrally molded body including interconnected walls defining a cavity opening through a bottom side of said body, band engagement means adjacent one end of said body engaging a portion of said rubber band, means at the end of said body opposite said one end receiving and rotatably supporting the drive shaft of said drive member adjacent said winding means with said hook within said cavity and sapced from said band engagement means to support said rubber band therebetween, and means on said walls along the bottom side of said body receiving and rotatably retaining the axle of said driven member with the axis of said axle transverse to the axis of said drive shaft, with said drive shaft on the side of said axle opposite said bottom side of said body to retain said drive shaft in place and with the teeth of said star gears positioned in right-angle engagement to transfer driving force from said rubber band to said wheels.

4,416,084

PROTECTIVE DEVICE

Giuseppe Zen, 3475 Pandora St., Vancouver, British Columbia, Canada (V5K 1W7)

Filed May 7, 1982, Ser. No. 375,852
Int. Cl.³ E06B *3/68*
U.S. Cl. 49—50 **5 Claims**



1. A protective device for a building adapted to be installed at a window to prevent ingress, the device comprising:

a first member adapted to be attached to one edge of the window;

a second member adapted to be mounted to a further edge of the window, opposed to the first member;

each member being a channel member of generally U-shape, the U having limbs joined by a bridge, with a flange extending from one limb of the U, remote from the bridge;

holes to receive screws formed in the flange; recesses formed in the bridge of the U at predetermined centers;

a bar extending between a pair of opposed recesses to prevent ingress,

holes extending through a limb of the U adjacent the flange to permit locating means to extend into the channel member to locate the bars, the bars also being located by the attachment of the members to the window edges.

4,416,085

AUTOMATIC GATE OPENER

Robert W. Lybecker; Karl A. Senghaas, both of San Antonio, and James W. Olafson, Kerrville, all of Tex., assignors to Bomar Corporation, San Antonio, Tex.

Filed May 3, 1982, Ser. No. 373,859
Int. Cl.³ E05F *15/02*
U.S. Cl. 49—340 **10 Claims**

1. A gate opening device for use at remote locations comprising:

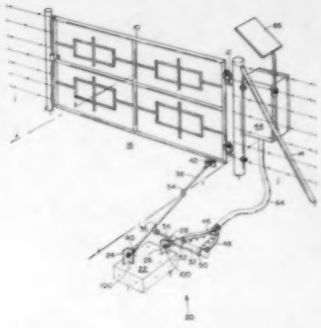
stationary mounting means;

linkage rod pivotally connected on a first end to said stationary mounting means and pivotally connected on a second end to said gate, said linkage rod having an intermediate pivot point between said first and second ends thereof;

cylinder means pivotally mounted on said stationary mounting means, said cylinder means having a cylinder rod extending therefrom with a first end being pivotally connected to said linkage rod and a second end forming a piston inside said cylinder means;

control means connecting to said cylinder means for operating said cylinder means, said control means including a bi-directional gear pump for supplying hydraulic fluid to operate said cylinder means; and

sensor means for signaling said control means to activate said bi-directional gear pump to suppy said hydraulic fluid under pressure to said cylinder means, said pressurized



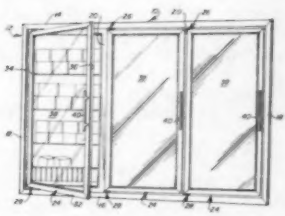
hydraulic fluid moving said gate to an opened or closed position via said piston, cylinder rod and linkage rod.

4,416,086

ADJUSTABLE DOOR MOUNTING ARRANGEMENT FOR REFRIGERATED DISPLAY CABINETS

Frank M. Niekrasz, Homewood, Ill., assignor to Ardco, Inc., Chicago, Ill.

Filed Aug. 3, 1981, Ser. No. 289,779
Int. Cl.³ E05D *7/08*
U.S. Cl. 49—388 **19 Claims**



1. An adjustable door mounting arrangement for mounting a door on a structure comprising:

a generally rectangular frame adapted to be affixed to said structure and defining a door opening and including a first frame member and a second frame member maintained in spaced, generally parallel relation by a plurality of transversely spaced apart column members;

first and second hinge means disposed at respective upper and lower corner portions of said door for hingedly connecting said door to said frame for providing swinging movement of said door inwardly and outwardly with respect to said door opening about an axis;

said first hinge means including adjustment means for adjustably positioning the first hinge means longitudinally of said first frame member whereby the axis about which said door swings may be shifted thereby accommodating realignment of said door relative to said frame

said first hinge means including a first hinge pin defining said swinging axis and extending outwardly from said door, said adjustment means comprising a first hinge bracket including a body portion defining pin receiving means and having upstanding lug means,

said first frame member including a web portion defining a first slot within which said lug means extends and is selectively positionable therewithin by shifting said hinge bracket longitudinally of said first frame member, said first

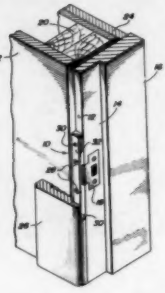
hinge pin extending within said pin receiving means and said first slot in said first frame member.

4,416,087

DOOR FRAME REINFORCER

Paritosh K. Ghatak, 510 Johnston Dr., Bethlehem, Pa. 18017

Filed Sep. 29, 1981, Ser. No. 306,690
Int. Cl.[3] E06B 1/04
U.S. Cl. 49—462 1 Claim



1. In a door frame, including, generally, a door jamb including a stop attached to an upright stud, and a striker plate or other bolt receiver means on said jamb, jamb reinforcing means comprising:

(a) a rigid brace bar located longitudinally proximate the edge of said jamb adjacent said bolt receiver; and

(b) at least two reinforcing rods positioned through said brace bar transversely into said jamb at a generally right angle thereto, said rods being of a length sufficient to span said jamb for a distance about at least two thirds the depth of the door frame; and,

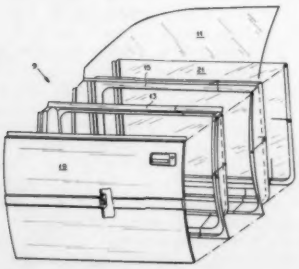
(c) nuts, one each mounted on said interior rod ends.

4,416,088

MOTOR-VEHICLE SIDE DOOR

Klaus J. Feucht, Geimersheim; Egbert Rossie, and Karl Bauer, both of Ingolstadt, all of Fed. Rep. of Germany, assignors to Audi NSU Auto Union AG, Ingolstadt, Fed. Rep. of Germany

Filed Feb. 3, 1981, Ser. No. 231,143
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004897
Int. Cl.[3] B60J 5/04
U.S. Cl. 49—502 8 Claims



1. A motor-vehicle door comprising:

a door frame having an inner side and an outer side and formed with a plurality of narrow threaded apertures opening at said outer side and with a plurality of relatively wide throughgoing holes;

a hinge connected to said frame between said sides;

an inner door panel against said inner side;

means releasably securing said inner panel to said inner side for forming of said frame and inner panel a door assembly;

a window pane vertically displaceable in and above said frame;

window-operating mechanism on said assembly connected to said pane for raising and lowering same;

a door latch on said frame;

door-latching mechanism on said assembly connected to said latch for operating same;

an outer door panel against said outer side and formed with respective relative wide holes at the narrow apertures of the frame and with a plurality of relatively narrow and inwardly open threaded apertures; and

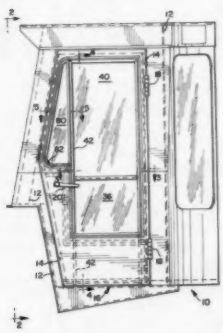
means including respective relatively narrow screw fasteners engaging through said wide holes in said threaded apertures for releasably securing said outer panel to said outer side for mounting said outer panel on said assembly and removing said outer panel from said assembly without removal of said inner panel, the loose fit of said fasteners in said wide holes permitting said outer panel to be shifted on said frame.

4,416,089

DOOR AND WINDOW ARRANGEMENT

Bernard J. Lambke, Jr., Kenosha, Wis., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 9, 1981, Ser. No. 252,516
Int. Cl.[3] B60J 5/04; E05D 15/22
U.S. Cl. 49—502 4 Claims



1. A door and window arrangement comprising:

a door frame having an inward projecting flange;

an outer frame having an outward projecting flange overlapping said inward flange;

a gimp pressed onto said flanges to hold said door frame and said outer frame together;

an inner frame defining a pair of tracks secured to said outer frame;

an insulating broad sealed into one of said tracks at its lower end;

a fixed pane of glass secured to and resting upon said board;

a movable pane of glass sealed to a movable frame;

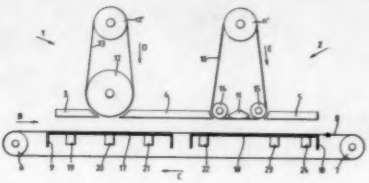
a slider member affixed to said movable frame and positioned in the other of said tracks; and

means for adjustably positioning said movable pane relative to said inner frame.

4,416,090
BELT SANDING MACHINE

Bertil Jonasson, Eneryda, Sweden, assignor to Landskrona Produktion AB, Sweden

Continuation of Ser. No. 142,502, Apr. 21, 1980, abandoned. This application May 13, 1982, Ser. No. 377,893
Claims priority, application Sweden, Apr. 25, 1979, 7903612
Int. Cl.³ B24B 21/04
U.S. Cl. 51—138 9 Claims



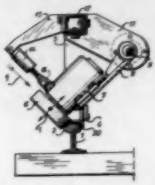
1. A belt sanding machine comprising:
a sanding unit having a feed direction with a feed end and an exit end with respect to said feed direction;
guide means at said feed and exit ends for setting the sanding depth of said sanding unit;
a flexible feed conveyor for feeding workpieces to be sanded in the feed direction past said sanding unit; and
a pressure table on the side of said feed conveyor opposite said sanding unit for pressing a workpiece positioned on said feed conveyor against said sanding unit and said guide means as the workpiece is fed past said sanding unit by said feed conveyor, said pressure table including a rigid planar support member rigidly set a preselected distance from said guide means, said support member having a plurality of openings therethrough; a plurality of pressure members, each pressure member movable through an associated support member opening between a retracted position in which said pressure member is retracted within said planar support member, allowing said feed conveyor to contact said planar support member to constitute a rigid support surface for pressing a workpiece against said sanding unit, and an extended position in which said pressure member extends through the associated support member opening to move said feed conveyor a distance from said planar support member; and means for resiliently urging each of said pressure members in their extended positions against said feed conveyor with substantially the same force so that said feed conveyor constitutes a resilient and flexible support surface for pressing a workpiece positioned thereon with a substantially constant pressure at any location thereof against said sanding unit and said guide means.

4,416,091
GRINDING DEVICE FOR THE CONTINUOUS AND IN SITU REPROFILING OF A RAILROAD TRACK

Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland

Filed Dec. 4, 1980, Ser. No. 213,073
Claims priority, application Switzerland, Dec. 31, 1979, 11502/79
Int. Cl.³ B24B 23/00
U.S. Cl. 51—178 7 Claims

1. Grinding device for the reprofiling in situ and continuously of a rail of a railway track comprising at least one grinding unit comprising at least one peripheral grinding wheel driven in rotation by means of a motor, this device being mounted on a tool carrying frame of a railroad vehicle so that the axis of rotation of the grinding wheel forms an angle with the longitudinal axis of the rail and that said rotation axis has no intersection with the rail itself, means to displace the grinding wheel vertically relative to the vehicle and to apply it against the rail with a determined force, and means automatically bodily moving the grinding wheel in an alternating movement along a direction forming an angle with the rail, the amplitude a of the alternating movement of the grinding wheel, projected into a plane perpendicular to the longitudinal axis of the rail

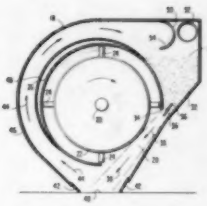


passing through the contact zone between the grinding wheel and the rail, being approximately equal to the projection l in the same plane, of the width of the working face of the grinding wheel diminished by the width f of the ground portion of the rail.

4,416,092
CLEANING APPARATUS

Robert T. Nelson, 12601 Arrowhead Ter., Oklahoma City, Okla. 73120

Continuation-in-part of Ser. No. 324,563, Nov. 24, 1981, abandoned. This application Jan. 7, 1982, Ser. No. 337,832
Int. Cl.³ B24C 3/02, 3/06
U.S. Cl. 51—425 5 Claims



1. An apparatus for movement over a surface external of the apparatus to clean the surface with abrasive material comprising:
(a) a housing having an enclosure with an opening for exposing a portion of the surface external of said housing to abrasive material from the apparatus;
(b) a rotatable drum within said housing, said drum including a plurality of circumferentially spaced blades extending radially from the peripheral surface of the drum for propelling abrasive material along a delivery path toward the surface to be treated;
(c) a hopper for storing abrasive material, said hopper having an opening communicating with said delivery path;
(d) means for delivering abrasive material from said hooper to said drum for propulsion of the abrasive material toward said housing opening, said means including said hopper opening and said blades, said blades being positioned to pass across said hopper opening in close proximity thereto for revoving abrasive material from said hopper and projecting it along said delivery path;
(e) said housing including a substantially unobstructed recovery path for receiving abrasive material rebounding from the surface being treated and returning the rebounding abrasive material to said hopper;
(f) said drum imparting sufficient kinetic energy to abrasive material delivered thereto to effect cleaning of the surface to be treated and to return rebounding abrasive material to said hopper;

(g) a drum housing substantially circumscribing said drum, said drum housing having an opening comprising a minor portion thereof to provide for delivery of abrasive material from said hopper to said blades and providing space for said delivery path, said hopper having an elongated opening at the bottom aligned with said drum housing opening so that small even slices of abrasive material are successively removed from said hopper by said blades and propelled along said delivery path; and

(h) said delivery path, the plane of rotation of said drum, said recovery path and said hopper lying in the same plane.

4,416,093

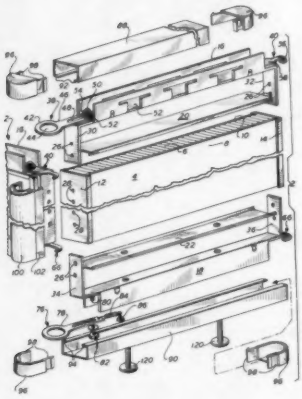
PANEL SYSTEM INTERCONNECTING MEANS

Stephen A. Salkeld, Mechanicsburg, and Mark E. Stock, McSherrystown, both of Pa., assignors to Litton Business Systems, Inc., York, Pa.

Continuation of Ser. No. 47,569, Jun. 11, 1979, abandoned. This application Feb. 8, 1982, Ser. No. 347,111

Int. Cl.³ E04B *1/346*

U.S. Cl. 52—71 **2 Claims**



1. In a panel system comprising a plurality of panels and means for interconnecting said panels, said interconnecting means including:

a first connecting member in a given plane, said first connecting member comprising ring member;

a second connecting member in the same plane as said first connecting member, said second connecting member comprising a hook member having a hook portion interengageable with said ring member;

said hook portion of said hook member extending completely through said ring member from one side of the latter to the other;

means mounting at least one of said connecting members for shifting movement in the same plane in which both said first connecting member and said second connecting member lie and in a direction away from the related interengageable connecting member; and

resilient means connected to said shiftably movable connecting member for biasing said shiftably movable connecting member in said direction away from the related interengageable connecting member.

4,416,094

ATTIC WINDOW ASSEMBLY

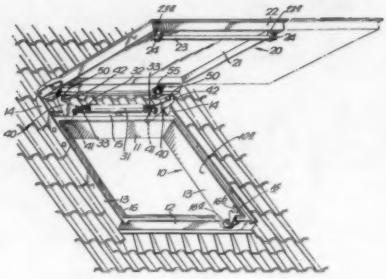
Franz Bügener, Heusenstamm; Manfred Rinklake, Friedrichsdorf; Werner Horch, Dietzenbach; Wilhelm Röttger, Heusenstamm; Günter Jöst, and Johann Kirsch, both of Rodgau, all of Fed. Rep. of Germany, assignors to Braas & Company GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 5, 1981, Ser. No. 270,900

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1980, 3031318

Int. Cl.³ E05F *1/00*; E04B *7/16*

U.S. Cl. 52—72 **11 Claims**



1. In a window assembly including a panel mounted for pivotal movement relative to a casing in a roof sheathing, a moving rib attached to the panel and a guide rib operatively connected to the moving rib, actuating means for automatically pivoting the panel from a closed position overlying the casing to an open position disposed at a predetermined angle to the casing comprising at least one actuating lever, a preloaded spring member connected between the ends of said actuating lever, one end of said actuating lever pivotally connected to the guide rib at a fixed pivot and the other end of said acutating lever being movably supported in a guide parallel to the longitudinal axis of said spring member whereby upon release of the panel from a closed position, movement of the other end of the actuating lever effects a pivoting of the guide rib and panel to a predetermined angular position relative to the casing for a given linear displacement of said spring member and wherein said guide may be fixed at different distances relative to the casing for selectively varying the angular displacement of said panel by said actuating means.

4,416,095

SUPPORT HANGER KIT FOR SUSPENSION CEILINGS AND METHOD OF INSTALLATION

Donovan Truluck, 313 Almeda Pkwy., Arnold, Md. 21012

Filed Sep. 1, 1981, Ser. No. 298,363

Int. Cl.³ E04B *5/52*

U.S. Cl. 52—173 R **18 Claims**

1. A new and improved method for installation of suspended ceilings between a set of parallel ceiling joists employing an improved support hanger; the support hanger having a generally U-shaped configuration that provides a generally U-shaped bend portion with the free ends thereof bent outwardly away from each other and downwardly toward the bottom of the U-shaped bend portion to form two hooked ends which open downwardly and lie in substantially the same plane with the U-shaped bend portion; the method comprising tying a suspension wire to be supported in space between the set of parallel ceiling joists near the U-shaped bend portion of the support hanger, inserting the U-shaped bend portion of the support hanger together with attached suspension wire in a keyway formed in the end of an elongated pole of sufficient length to reach between the parallel ceiling joists from the

floor, the keyway in the end of the pole providing a press fit for the support hanger U-shaped bend portion and preventing relative rotation between the inserted support hanger and the pole, raising the end of the pole with the inserted support hanger and attached suspension wire through the space between the set of parallel ceiling joists by orienting the pole and support hanger insert so that the plane containing the downwardly directed hooked ends is parallel to the axes of the set of parallel ceiling joists, raising the end of the pole together with the inserted support hanger sufficiently above the level of the parallel ceiling joists so that the support hanger hooked ends

will clear the tops of the ceiling joists, rotating the pole and inserted support hanger relative to the set of ceiling joists so that the plane containing the downwardly directed hooked ends is substantially at right angles with respect to the longitudinal axes of the set of parallel ceiling joists, lowering the end of the pole with the inserted support hanger thus oriented to cause the downwardly directed hooked ends of the support hanger to engage the tops of the ceiling joists and tugging the end of the pole downwardly with sufficient force to release the support hanger from its press fit in the keyway and leave it suspended together with its attached suspension wire at a desired point in space along the length of the ceiling joists.

4,416,096

INSULATING WINDOW INSERT

Allan C. Schuster, and Georgia L. Schuster, both of 439 E. Main St., Whiteland, Ind. 46184

Filed Sep. 25, 1981, Ser. No. 305,758
Int. Cl.³ E06B *3/26*
U.S. Cl. 52—202 **3 Claims**

1. An insulating window insert panel for forming a vapor and draft barrier and for supporting decorative material for use with double hung windows or the like comprising:

a generally rectangularly shaped block of polystyrene foam having a shape adapted to fit between the window sills and window frame members on the sides and in spaced relation to one of the window lights,

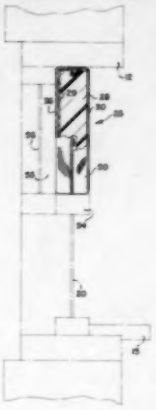
means in said block forming a peripheral groove,

a sheet of vapor barrier material positioned between said block and said window light having a marginal edge received in said groove,

a blanket of fluffy polyester material positioned in overlying relation to said vapor barrier sheet and also having marginal edges adapted to be received in said groove,

a front sheet of decorative material positioned on the exposed frontal surface of said block and having marginal edges adapted to be received in overlying relation to the edge of said block, and

a retainer band encircling said block in said groove gripping the marginal edges of said vapor barrier and said blanket and compressing the same in said groove, whereby said panel may be fitted tightly inside the window frame forming an insulating barrier and vapor shield while supporting



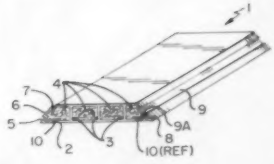
decorative material for viewing from the inside of the room.

4,416,097

UNIVERSAL BEAM CONSTRUCTION SYSTEM

Richard L. Weir, 2217 Grant Ave., Dayton, Ohio 45406

Continuation of Ser. No. 659,836, Feb. 20, 1976, abandoned. This application Nov. 16, 1977, Ser. No. 851,965
Int. Cl.³ E04F *17/08*; E04C *1/10, 1/04*
U.S. Cl. 52—220 **9 Claims**



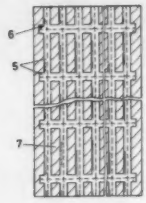
1. An element of construction which is reversible in application, comprising an elongate relatively flat, plate-like body having parallel outer faces one of which is wider than the other and oppositely sloping side edges, one of which sloping side edges has projecting means formed integral therewith and the other of which is recessed to accommodate like projecting means on a similar element, said side edges being constructed and arranged to provide that a plurality of said elements can be brought together in a side edge abutting relation to form a wall structure wherein adjacent elements may be co-planar or at right angles to each other or compositely arranged to form a structural beam, depending on the differential positioning of the adjacent elements in one sense or another enabled by their reversibility, at least one outer face of said element embodying therein means defining a recess providing that on placing a pair of said elements with faces thereof including said recess in abutting relation and with said recesses therein aligned, said recesses commonly accommodate a male configured connecting device to join said elements in their face abutted relation.

4,416,098

SLAB-SHAPED BUILDING ELEMENT

Johann Goidinger, A-6511 Zams/Österreich, Hinterfeldweg 8, Austria

Filed May 22, 1981, Ser. No. 266,282
Claims priority, application Austria, Jun. 2, 1980, 2901/80
Int. Cl.³ E04C 2/04
U.S. Cl. 52—309.16 14 Claims



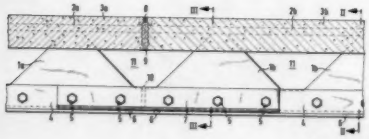
1. A slab-shaped building element, particularly a wall element of a one story height, of lightweight concrete reinforced by reinforcing rods, wherein at least one grid of heavy concrete is enclosed in said lightweight concrete parallel to side faces of said building element, a reinforcing grid consisting of reinforcing rods being disposed in said grid of heavy concrete, said lightweight concrete being bonded directly to said heavy concrete grid.

4,416,099

COMPOUND GIRDER FORMING A RIGID CONNECTION FOR PREFABRICATED CEILING PANELS

Ulrich Fiergolla, Schillerstrasse 8, 4992 Espelkamp, and Josef Rottmayr, Eduard-Schmid-Strasse 26, 8000 Muenchen 90, both of Fed. Rep. of Germany

Filed May 18, 1981, Ser. No. 264,416
Claims priority, application Fed. Rep. of Germany, May 23, 1980, 3019744
Int. Cl.³ E04B 1/20
U.S. Cl. 52—319 9 Claims



1. A compound girder of a type to be assembled at least partially at the building site, for rigidly connecting in a bending stiff manner a plurality of prefabricated concrete ceiling panels each panel having a given width, comprising separate compression upper chord sections each corresponding in its length substantially to the given width of the corresponding concrete ceiling panel, said separate upper chord sections being embedded in the concrete of the respective ceiling panel, a plurality of initially separate web means rigidly and individually secured to the respective separate upper chord section, said separate web means having an upper portion partially embedded in the concrete of the respective ceiling panel so that a lower portion of the separate web means projects from the respective ceiling panel, initially separate lower tension chord means having an uninterrupted length corresponding to the girder length, and connecting means securing said projecting lower web portions to said lower chord means, whereby the length of the ceiling panels extends across the length of the girder.

4,416,100

MODULAR WOODEN FLOOR UNITS AND METHOD OF MANUFACTURE THEREOF

Roy A. Troendle, Sr., New Orleans, La., assignor to Troendle, Inc., New Orleans, La.

Filed Sep. 4, 1981, Ser. No. 299,334
Int. Cl.³ E04F 15/022
U.S. Cl. 52—390 1 Claim

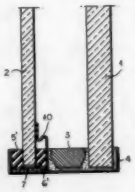
1. A modular floor unit comprising a plurality of lengths of tongue and groove strip flooring having a flat smooth finish on one side and a plurality of channel recesses on their other side
(a) said lengths of floor stripping all being of the same length and solid uniform thickness with the tongues inserted in the grooves,
(b) a plywood backing member shorter than the length of said stripping and extending beyond one long end of said stripping on the side opposite the flat smooth finish side, the grain of said plywood being at a right angle to the longitudinal axis of the lengths of said strip flooring,
(c) a bonding glue in said channel recesses between said stripping and said plywood,
(d) a plurality of staple means connecting said plywood backing to said stripping, said staples entering said strip flooring from the plywood side, and
(e) said modular unit of stripping having a tongue end across one end of said stripping and a grooved end across the opposite end.

4,416,101

INSULATING GLASS WINDOW STRUCTURE

Paul Derner, Gelsenkirchen, and Dietrich Mertin, Witten, both of Fed. Rep. of Germany, assignors to BFG GLASSGROUP, Paris, France

Filed Apr. 13, 1981, Ser. No. 253,297
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1980, 3014207
Int. Cl.³ E04C 1/42
U.S. Cl. 52—398 6 Claims



1. An insulating window structure comprising:
an inner glass pane;
an outer glass pane;
a frame including means for spacing said panes apart, said frame extending around the periphery of said panes to define therein a gas-filled space; and
resilient means for connecting at least one of said panes to said frame so as to enable the displacement of said one of said panes toward and away from the other of said panes, said resilient means having at least one leaf spring characteristic in which restoring force against said one of said panes is plotted along an ordinate and displacement of said one of said panes is plotted along the abscissa of a graph which has a horizontal portion centrally of said characteristic, said resilient means acting upon said one of said panes at a working point of said characteristic lying along

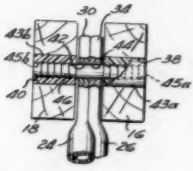
said horizontal portion whereby force resisting displacement of said one of said panes remains substantially constant during displacement thereof against said resilient means.

4,416,102

PLASTIC BUSHING FOR USE WITH STEEL/WOOD TRUSS STRUCTURES

Dierk D. Peters, 16526 Zumaque St., Rancho Santa Fe, Calif. 92067

Filed Sep. 2, 1980, Ser. No. 182,952
Int. Cl.³ E04C 3/02
U.S. Cl. 52—692 **12 Claims**



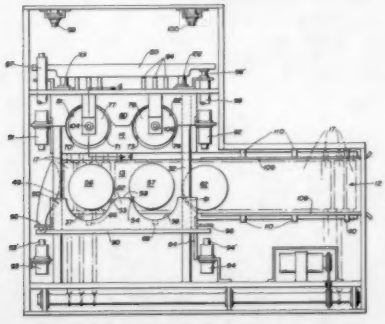
1. A truss joist assembly comprising:
(a) two spaced chord sections, each of said chord sections having an opening;
(b) a metal web diagonally spanning said chord sections between said openings, each end of said web having an aperture which is of smaller diameter than said chord section openings, each said web aperture being registered with one of said chord section openings;
(c) resilient means for absorbing vibrations to said truss joist assembly, said vibrational absorbing means being positioned within at least one of said chord section openings and having a bore coaxial with said chord section opening;
(d) a pin penetrating said web aperture and said bore to secure said web to said chord sections.

4,416,103

APPARATUS FOR LOADING SLICED AND BULK FOOD PRODUCTS

Gerald Ewer, 2818 Calaveras Dr., Fairfield, Calif. 94533, and Arnold Agre, 8762 Gray Fox Dr., Evergreen, Colo. 80439

Filed Feb. 6, 1981, Ser. No. 232,135
Int. Cl.³ B65B 25/06, 35/40, 57/14; B65G 25/08
U.S. Cl. 53—517 **2 Claims**



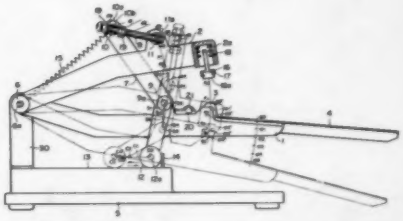
2. Apparatus for supporting a knife-edge penetratable product at a loading station for transfer by plunger means of the product to a receiving station including, a plurality of knife blades in a single horizontal plane having sharpened edges positioned for engagement and temporary support of said product on said edges proximate the perimeter of said product, and a movable support member mounted to support said product at said loading station and formed for retraction from said loading station to deposit said product on said edges, wherein the improvement in said apparatus is comprised of:
means for uni-directional retraction of said movable support member, and said plurality of knife blades consists of three knife blades, a first two of which are mounted in spaced relation for engagement of said product at its perimeter as said movable support member begins to retract and the third of which is mounted for engagement of said product at its perimeter opposite said first two when said movable support member is fully retracted.

4,416,104

CLAMPING MECHANISM FOR IMPULSE SEALER

Teruo Yamada, Suita, Japan, assignor to Fuji Manufacturing Company Limited, Osaka, Japan

Filed Sep. 21, 1981, Ser. No. 304,412
Int. Cl.³ B65B 7/06, 51/14
U.S. Cl. 53—371 **7 Claims**



1. A work clamping mechanism comprising a base member having first pivot means thereon, a pair of spaced apart parallel drive arms pivoted at one end on said first pivot means, work support means secured to the opposite ends of said drive arms, pressure bar means pivotally mounted at one end on said pivot means between said drive arms and having clamping means secured to the opposite end thereof, second pivot means on each of said drive arms intermediate the ends thereof, a pair of lever arms pivoted at their mid-points on said second pivot means with one end of each lever slidably engaging said base member and connecting means pivotally connected to the opposite ends of said lever arms and pivotally connected to said pressure bar means between the ends thereof so that upon pivoting of said drive arms by the work support means said pressure bar means is pivoted through said lever arms and connecting means to clamp the work between said clamping means and said work support means.

4,416,105

TRAINING DEVICE FOR HORSES

Yves Gauthier, 7433 St. Vincent, Ste. Scholastique, Mirabel, Quebec, Canada J0N 1S0, and Robert Gravel, 3195 Dickson Ave., Montreal, Quebec, Canada H1N 2J9

Filed Sep. 21, 1981, Ser. No. 304,177
Int. Cl.³ B68B 1/00
U.S. Cl. 54—71 **3 Claims**

1. A horse training device comprising a flat backing plate;

a pad of sponge-like material affixed to one side of said backing plate;

a plurality of pins of slightly lesser length than the thickness of said pad, mounted on said backing plate so that their pointed ends are normally retained within said pad, said pad being compressible to expose the pointed ends of said pins; and

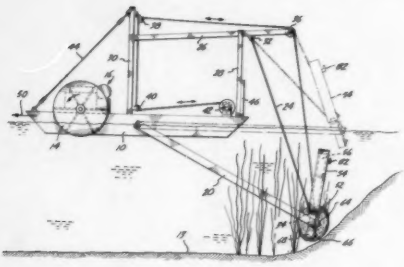
mounting backets on the side of said backing plate opposite said pad for mounting said backing plate on a head pole whereby on turning of the head of the horse beyond a predetermined degree, the pad is compressed and the pointed ends exposed for contact with the horse's skin.

4,416,106

METHOD AND APPARATUS FOR REMOVAL OF AQUATIC PLANT GROWTH

James L. Hawk, 22435 SE. 288th, Kent, Wash. 98031

Filed Apr. 8, 1982, Ser. No. 366,478
Int. Cl.³ A01D *44/00*
U.S. Cl. 56—8 **14 Claims**



1. A method of removing aquatic plants growing from the bottom of a body of water comprising the steps of:

(a) moving a first, substantially horizontally oriented, elongate bar through the plants beneath the surface of the water permitting the plant stalks to wrap around the bar;

(b) continuing to move the bar and wrap the plant stalks thereby breaking the stalks of at least a first portion of the plants at a point between the bar and the plant roots and pulling the roots of at least a second portion of the plants out of the bottom;

(c) moving the bar to a desired location and severing the plant stalks wrapped around said bar to free the plant stalks from the bar.

4,416,107

LAWN MOWER BLADE CONTROL MECHANISM

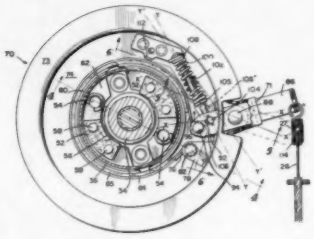
Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Continuation-in-part of Ser. No. 158,700, Jun. 12, 1980, Pat. No. 4,362,368. This application Apr. 16, 1982, Ser. No. 369,121
Int. Cl.³ A01D *69/10*
U.S. Cl. 56—11.3 **17 Claims**

1. Lawn mower blade control mechanism having a driving drum mounted on the depending end of a drive shaft, a blade carrier mounted for coaxial rotation therewith and comprising clutch shoes movably mounted on said blade carrier and biased toward clutching engagement with said drum, brake drum segments connected to move the shoes to declutched position, and a brake band surrounding the brake drum segments and movable thereagainst to de-clutch the shoes and brake the blade carrier, wherein the improvement comprises a brake lever pivoted on a supporting pivot located radially outward from the path of said brake segments and having a lever arm extending generally radially inward from such pivot to a connection with a movable end of said brake band located close to said path,

a spring reaction support spaced angularly from said movable end of the brake band, and a compression spring reacting against said reaction support and extending therefrom closely beside and tangentially along said movable end,

means for connecting the free end of the spring for movement with and for transmitting force to said movable end of the brake band in a direction generally parallel with and in the same direction as the brake-engaging movement of said movable end, so as to apply spring force from said closely and tangentially disposed spring substantially directly to the movable end of the brake band to bias the same to brake-engaged position, and



means adapted to be actuated manually by the lawn mower operator for moving said lever arm and movable end of the brake band, against the bias of said spring, to disengage the brake band from engagement with said brake drum segments and thereby permit said clutch shoes to move into engagement with said driving drum,

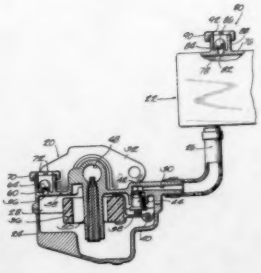
wherein said means for connecting the free end of the spring and transmitting force therefrom to the movable end of the brake band comprises means connecting such free end to a thrust point on said lever arm between its pivot axis and its connection with the movable end of the brake band so that when said lever is in brake-ON position, the spring exerts thrust thereon along a thrust line at an angle close to 90° to a line connecting the lever pivot to the thrust point.

4,416,108

DEVICE FOR REDUCING EVAPORATION LOSS FROM CARBURETORS AND FUEL TANKS

Burzoe K. Ghandhi, Whitefish Bay, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 12, 1982, Ser. No. 367,591
Int. Cl.³ A01D *35/00*; B65D *51/16*
U.S. Cl. 56—17.5 **11 Claims**



1. A lawn mower including a blade housing, a wheel for

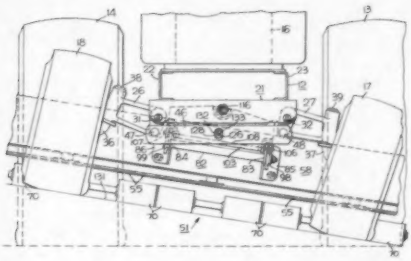
supporting the blade housing for movement along the ground, a rotatable cutting blade supported in the blade housing, and an internal combustion engine for rotatably driving said cutting blade, the internal combustion engine including a carburetor having a float bowl adapted to contain a quantity of liquid fuel and adapted to have a contained air space above the liquid fuel, and means for selectively venting said float bowl to the atmosphere, said means for selectively venting including means for venting the air space to the atmosphere in response to engine vibration when said internal combustion engine is running and for precluding evaporation of fuel from the float bowl into the atmosphere when said engine is not running.

4,416,109

MOWER ATTACHMENT DRAFT LINKAGE RESPONDING TO GROUND CONTOUR

John J. Slazas, Cedarburg, Wis., assignor to Simplicity Manufacturing, Inc., Port Washington, Wis.

Filed Jan. 3, 1983, Ser. No. 455,006
Int. Cl.³ A01D *35/28*
U.S. Cl. 56—209 **5 Claims**



1. In combination with a tractor having a longitudinally extending main frame supported at its front end by a pair of laterally spaced steerable wheels and at its rear end by a pair of laterally spaced traction wheels,

a pair of laterally extending spindle supports having their laterally inner ends pivotally connected to laterally spaced points of said front end of said main frame for vertical swinging movement about a first pair of parallel longitudinal axes,

a pair of spindles rotatably supporting said front wheels and having upright portions pivotally connected to laterally outer portions of said spindle supports, respectively, for steering movement relative thereof about a pair of generally upright laterally spaced steering axes,

a laterally extending axle link having its laterally opposite ends pivotally connected to the laterally inner ends of said spindle supports on a second pair of longitudinal axes parallel to and spaced below said first pair of longitudinal axes,

a mower in underslung relation to said tractor including at least one rotary cutting blade and a housing for said blade,

a longitudinally extending hitch member connected to laterally spaced portions of said mower housing,

a transversely extending mower hitch support pivotally connected intermediate its laterally opposite ends to said front end of said frame for pivotal movement about a central longitudinal axis,

pivot means pivotally connecting said laterally opposite ends of said hitch support to laterally spaced portions of the front end of said hitch member for vertical swinging movement of the latter about a transverse pivot axis, and

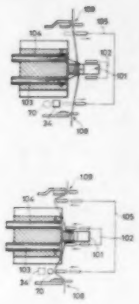
a lateral thrust connection between a central part of said axle link and an intermediate part of said hitch support disposed below said central longitudinal axis, said thrust connection being operable to swing said hitch support about said central longitudinal axis to maintain said transverse axis in substantially parallel relation to the ground traversed by said front wheels during predetermined swinging movement of said spindle supports about said first pair of longitudinal axes.

4,416,110

SPLICING APPARATUS FOR SPUN YARNS

Hiroshi Mima, Joyo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 22, 1982, Ser. No. 360,697
Claims priority, application Japan, Mar. 23, 1981, 56-42927
Int. Cl.³ D01H *15/00*
U.S. Cl. 57—22 **7 Claims**



1. A splicing apparatus for spun yarns comprising a splicing member arranged at the center of the splicing apparatus and including a splicing hole for jetting a compressed fluid to the lapped portion of two yarn ends to effect splicing, clamping device for clamping yarn ends on the package side and on the bobbin side, respectively, before the yarn splicing operation, cutting device for cutting yarn ends, untwisting nozzles which are arranged on both the sides of the splicing hole so that the yarn ends of a predetermined length from the clamping point are sucked into the untwisting nozzles to be untwisted, a yarn gathering lever having a supporting shaft and levers turning with the shaft as the fulcrum and arranged between the clamping point and the splicing hole to take out the yarn ends left in the untwisting nozzles, and a stopping means for regulating the quantity of turning of the yarn gathering lever.

4,416,111

AIR MODULATION APPARATUS

Dean T. Lenahan; Robert J. Corsmeier, both of Cincinnati, Ohio, and Albert P. Sterman, deceased, late of Cincinnati, Ohio (by Florence G. Sterman, executor), assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

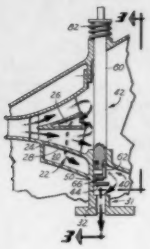
Filed Feb. 25, 1981, Ser. No. 238,257
Int. Cl.³ F02C *7/18*
U.S. Cl. 60—39.29 **21 Claims**

1. In a gas turbine engine having a cooling air circuit therein for directing cooling air to an engine rotor component, an air modulation apparatus comprising:

(a) an annular nozzle including a plurality of circumferentially spaced vanes and a plurality of flow passages, each of said flow passages being disposed between and defined by adjacent ones of said vanes and each flow passage having an inlet and an outlet, each said inlet being effective for receiving a portion of said cooling air;

(b) valve means effective for covering only a portion of said nozzle to prevent flow to a first portion of said plurality of flow passages and thereby reducing the amount and increasing the velocity of cooling air exiting freely from a

remaining portion of said plurality of flow passages of said nozzle not provided with valve means; and



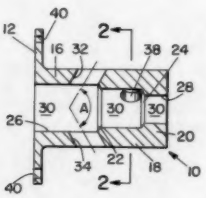
(c) actuation means for opening and closing said valve means.

4,416,112

FUEL INJECTOR FOR DUCTED ROCKET MOTOR

Gary W. Johnson, McGregor, Tex., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 28, 1981, Ser. No. 334,505
Int. Cl.³ F02K 7/10
U.S. Cl. 60—251 **14 Claims**



1. A fuel injector for a ducted rocket motor through which fluid fuel from a gas generator passes and is distributed into the secondary combustor of the motor, said fuel injector comprising:

an elongate tubular member having a fuel flow passage that extends axially through said tubular member between an entry orifice for entry of compressible fluid fuel into said tubular member and an exit orifice, rearward of said entry orifice, for exit of a portion of said fluid fuel from said tubular member;

said axial fuel flow passage having a cross-sectional area that decreases at a first rearwardly sloping step located between an entry annular section of said tubular member that comprises said entry orifice and a center annular section of said tubular member adjacent and rearward said entry annular section and further decreases at a second rearwardly sloping step located between said center annular section and an exit annular section comprising said exit orifice;

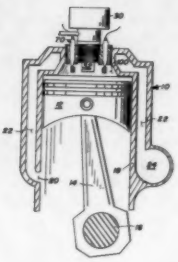
said axial fuel flow passage communicating with radial fuel flow passages that permit exit radially from said tubular member of another portion of said fluid fuel, said radial passages grouped fore and aft along said tubular member, a forward group thereof having a pair of said radial flow passages spaced from one another about said entry annular section and extending through the wall thereof adjacent said first step and a rearward group thereof having a rearward pair of said radial flow passages spaced about said center annular section and extending through the wall thereof adjacent said second step.

4,416,113

INTERNAL EXPANSION ENGINE

Francisco Portillo, Ave. Durango Y 12 ESTE #231, Cananea, Sonora, Mexico

Filed Dec. 15, 1980, Ser. No. 216,436
Int. Cl.³ F01K 21/02
U.S. Cl. 60—513 **4 Claims**



1. An expansion engine system, comprising:

a source of non-combusting liquid operating fluid;

a solenoid-operated fluid injector valve means including a solenoid having a central aperture, spring means operatively disposed in said aperture, an armature means adapted to move longitudinally up and down within said aperture, said spring means for normally biasing said armature longitudinally at least partially out of said aperture and said armature means being responsive to the energization of said solenoid for moving longitudinally upward against said spring bias and substantially within said aperture said fluid injector valve means further including a pressure cavity, an inlet to said pressure cavity for supplying said liquid operating fluid from said supply thereto, injection cage means operably disposed at the lower longitudinal end of said fluid injector valve, said cage means including a generally cup-shaped member having a top opening to a generally cylindrical bore and a closed bottom, a plurality of radial apertures operably disposed about the periphery thereof for injecting said operating fluid from said bore under inlet pressure, a longitudinally activated slug means dimensioned to be operatively received within said bore of said cage means and having a plurality of longitudinally aligned feed apertures communicating said pressure cavity with said cage bore, one side of said slug means being operatively coupled to said solenoid armature for moving longitudinally up and down therewith and substantially in and out of said cage bore, said slug means having walls for operatively sealing the radial output injection apertures of said cage means with said slug walls and for sealing the bottom apertures of said slug means against said closed bottom of said cage bore whenever said armature is at least partially out of said armature, and being responsive to the energization of said solenoid to lift longitudinally upward as said armature moves against said spring bias into said aperture for unsealing said radial cage apertures and feeding said liquid operating fluid from said pressure cavity under inlet pressure through the longitudinal feed apertures of said plug means into said cage bore for injection through the radial apertures thereof to permit fluid injection therefrom.

a motor-driven constant pressure injector pump means for supplying said non-combusting operating fluid under pressure from said source into said inlet of said solenoid-operated fluid injector valve means;

linkage means including a cylinder block, a piston having a piston face, said piston being adapted to move longitudinally up and down within said cylinder block, said cylinder block having an exhaust port, a rotatable shaft, and

means operatively coupled between said piston and said shaft for translating said reciprocating piston movement into shaft rotation for doing work and the like, said linkage means also including an expansion chamber operably disposed longitudinally above said piston face for transforming an expansion of said operating fluid therein into a longitudinally downward movement of said piston within said cylinder block, said cage means being operably disposed into said expansion chamber for injecting said operating fluid therein, and condenser means being operably coupled to said cylinder block for condensing said operating fluid vapor exiting said exhaust port for improving the flow efficiency of the engine;

control means for timing the injection of said liquid operating fluid into said expansion chamber;

evaporation means for rapidly vaporizing said injected liquid operating fluid into a vapor state;

said evaporation means to be operably coupled into said cylinder housing and disposed within said expansion chamber for vaporizing operating fluid coming into contact therewith;

power supply means for controlling the energization of said evaporation means.

4,416,114

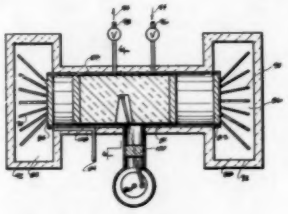
THERMAL REGENERATIVE MACHINE

William R. Martini, 2303 Harris, Richland, Wash. 99352

Filed Jul. 31, 1981, Ser. No. 289,043

Int. Cl.³ F02G 1/04

U.S. Cl. 60—526 **7 Claims**



1. A thermal regenerative machine comprising:

a vessel chamber filled with a gaseous working fluid, said chamber having a heat source surface at one end, a heat sink surface at its remaining end, and a side wall connecting the two ends;

a porous heat exchange assembly located within the vessel chamber and defining an expansion space adjacent to the heat source surface and a compression space adjacent to the heat sink surface;

means for cyclically varying the volumes of the expansion space and compression space so as to alternately expand the gaseous working fluid in the expansion space and compress the gaseous working fluid in the compression space and to further move the gaseous working fluid back and forth between the expansion space and compression space through the heat exchange assembly;

said heat exchange assembly comprising:

first thermal conductor means facing outwardly toward the heat source surface for alternately (1) receiving heat by conduction and radiation when near the heat source surface or (2) supplying heat to the gaseous working fluid either passing through the first thermal conductor means or located in the expansion space by convection and radiation;

second thermal conductor means facing outwardly toward the heat sink surface for alternately (1) transferring heat by conduction and radiation when near the heat sink surface or (2) absorbing heat from the gaseous working fluid either passing through the second thermal conductor means or located in the compression space by convection and radiation;

regenerator means interposed between said first and second thermal conductor means for thermally insulating them from one another while allowing the gaseous working fluid to move back and forth between them in a substantially thermodynamically reversible manner;

the heat storage capacity of the first thermal conductor means being adequate to supply the quantity of heat required by the gaseous working fluid in the expansion space for one cycle without substantial change in the temperature of the first thermal conductor means;

the heat storage capacity of the second thermal conductor means being adequate to absorb the quantity of heat produced by the gaseous working fluid in the compression space for one cycle without substantial change in the temperature of the second thermal conductor means.

4,416,115

INTERNAL COMBUSTION ENGINE WITH SUPERCHARGER

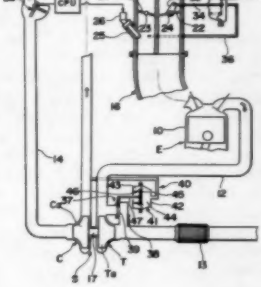
Koso Iida, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed May 28, 1981, Ser. No. 267,857

Claims priority, application Japan, Jun. 5, 1980, 55-79051[U]

Int. Cl.³ F02M 35/10; F02D 23/00

U.S. Cl. 60—600 **7 Claims**



1. A fuel supply system for an internal combustion engine having at least one combustion chamber, which system comprises, in combination:

a supercharger;

a fuel intake passage means communicating at one end with a source of air through said supercharger and at the opposite end with the combustion chamber, a portion of said fuel intake passage means between said supercharger and the combustion chamber having a partition wall formed therein for defining first and second intake passages;

an exhaust manifold leading from the combustion chamber to the atmosphere for discharge of exhaust gases emitted from the engine;

primary and secondary throttle valves operatively housed within said first and second intake passages, respectively, for regulating the flow of air towards the combustion chamber, said primary throttle valve being adapted to be controlled by an acceleration pedal;

means for biasing said secondary throttle valve to assume a closed position to substantially close said second intake passage;

means, responsive to the pressure inside a portion of said fuel intake passage means at a position downstream of at least

one of said primary and secondary throttle valves and upstream of the combustion chamber with respect to the direction of flow of air towards the combustion chamber, for opening said secondary throttle valve against said biasing means when the pressure attains a value at least as great as a predetermined value, such that opening of said secondary throttle valve gradually increases with increases in the pressure; and

a fuel injecting nozzle for supplying fuel to the combustion chamber in admixture with the air fed through said intake passage means in a controlled air-fuel mixing ratio.

4,416,116

THERMAL ENGINE ARRANGEMENT

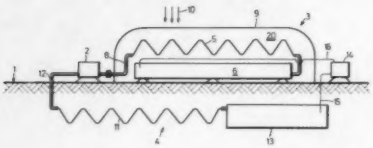
Alexander Kückens, Schillerstrasse 22, 2067 Reinfeld/H., Fed. Rep. of Germany

Filed May 28, 1981, Ser. No. 268,110

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3024016

Int. Cl.³ F03G 7/02

U.S. Cl. 60—641.8 **8 Claims**



5. A thermal power engine arrangement comprising a closed series circuit for a vaporizable refrigerating agent utilized as the thermal fluid for the engine including, a condensate storing and preheating tank, an evaporator connected to said storing and preheating tank, a hood enclosing the storing and preheating tank and evaporator directly exposed to the heat of the air and to solar radiation and defining a common heating chamber for the storing and preheating tank and evaporator, a thermal power engine connected to the evaporator and drivable by vaporized refrigerating agent, a condenser coil connected to the engine to receive refrigerant from the engine, a condensate collecting tank connected to the condenser coil for receiving condensate from the condenser coil, said condenser coil and collecting tank being located at a predetermined depth beneath the ground surface in direct heat transfer contact with the ground and a condensate pump connected to the collecting tank and storing and preheating tank for conveying the condensate from the collecting tank into the storing and preheating tank and a vaporizable refrigerating agent in the closed series circuit.

4,416,117

THERMALLY PRODUCING A HIGH-SPEED ATOMIZED LIQUID JET

Johan E. Nyberg, 18 Kyrkogatan, S-981 00 Kiruna, Sweden

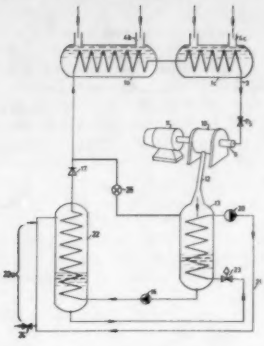
Filed Jan. 21, 1981, Ser. No. 226,700

Claims priority, application Sweden, Feb. 1, 1980, 8000826

Int. Cl.³ F01K 25/02

U.S. Cl. 60—650 **4 Claims**

1. A method of thermally producing a flow of a working medium, especially for driving turbines and the like, the method comprises heating the working medium to a predetermined temperature in a closed space at a pressure, maintaining said pressure at a value exceeding the steam formation pressure of the working medium at said temperature such that the working medium is in liquid phase, tapping a controlled flow from the closed space, passing the liquid flow through at least one



outflow nozzle against lower pressure to form a jet of atomized small droplets of liquid.

4,416,118

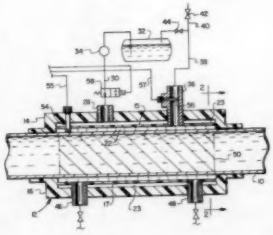
METHOD AND APPARATUS FOR CONTROLLING THE FORMATION OF A TEMPORARY PLUG IN A FLUID TRANSMISSION LINE

Beryle D. Brister, P.O. Box 9272, Amarillo, Tex. 79105

Filed Dec. 21, 1981, Ser. No. 332,231

Int. Cl.³ F25C 1/00

U.S. Cl. 62—66 **8 Claims**



1. A method for controlling the formation of a temporary plug in a fluid transmission line, said plug comprising a quantity of liquid disposed within the interior of said transmission line and frozen by circulating a cryogenic fluid through a chamber formed by a housing disposed around the exterior of said transmission line;

providing a housing disposed around the exterior of said transmission line and forming a chamber delimited at least in part by the exterior surface of said transmission line, said housing including a fluid inlet conduit and a fluid vent conduit;

providing a first temperature sensor at a point above said surface of said transmission line delimiting said chamber and in the flow path of said cryogenic fluid through said chamber below which point the level of liquid cryogenic fluid is to be limited;

circulating a cryogenic fluid through said chamber and venting fluid vapor from said chamber through said vent conduit;

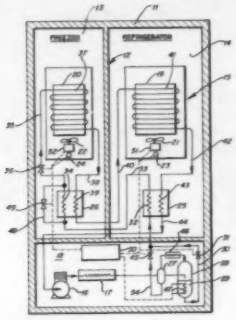
sensing a change in temperature at said point in said flow path; and

throttling the flow of cryogenic fluid to said chamber when the sensed temperature indicates the presence of liquid cryogenic fluid at said point in said flow path.

4,416,119
VARIABLE CAPACITY BINARY REFRIGERANT REFRIGERATION APPARATUS

Raymond G. Wilson, and Edwin H. Frohbieter, both of Lincoln Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 8, 1982, Ser. No. 338,581
Int. Cl.³ F25B *41/00, 17/00*
U.S. Cl. 62—149 **22 Claims**



1. In a refrigeration apparatus having means defining a below-freezing refrigerated zone and an above-freezing refrigerated zone, means for providing binary refrigerant to said zone for refrigerating said zone including a compressor and a condenser, a first evaporator in heat transfer association with said below-freezing refrigerated zone, a second evaporator in heat transfer association with said above-freezing refrigerated zone, a first heat exchanger, a second heat exchanger, and refrigerant flow conduit means providing a flow circuit successively through said first heat exchanger, said second heat exchanger, said first evaporator, said second heat exchanger in heat exchange relationship with the refrigerant flowing therethrough to said first evaporator, said second evaporator, and said first heat exchanger in heat exchange relationship with the refrigerant flowing therethrough to said second heat exchanger, to said compressor, the improvement comprising:

bypass means for causing the refrigerant to bypass said second heat exchanger as an incident of the temperature in said above-freezing zone rising above a preselected temperature and the temperature in said below-freezing zone remaining below a second preselected temperature.

4,416,120
SPRAY ASSEMBLY FOR REFRIGERATED DISPLAY CASES

Munim Yono, 41292 Marks Dr., Novi, Mich. 48050, and Russell L. Dolin, 190 Southfield, Ecorse, Mich. 48229

Filed Aug. 6, 1982, Ser. No. 405,931
Int. Cl.³ A47F *3/04*
U.S. Cl. 62—231 **7 Claims**

1. A spray assembly for refrigerated display cases, each case having front, rear, top and end walls and converging downwardly inclined bottom plates having a depending drain pipe;

a hollow base upon a floor underlying and supporting said bottom plates and case including a first chamber, said drain extending through said base and adapted for connection to a sewer pipe;

front and rear ledges in said case interconnecting and supported upon said end walls and spaced above said bottom plates;

a refrigerating system including tubing underlying connected to and spanning said ledges;

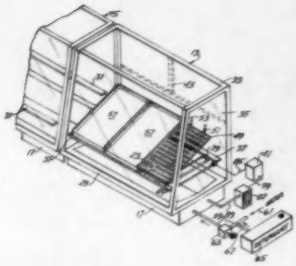
a series of laterally aligned downwardly inclined wire grates at their front edges mounted upon said front ledge adjacent said front wall and at their rear edges adjustably mounted upon said rear wall above said rear ledge;

said grates with adjacent front, rear and end walls and bottom plates defining a spray chamber;

said grates adapted to supportably mount thereon a series of laterally aligned food display pans;

a water pipe connectable to a source of pressurized water extending into and along the bases of said cases within said first chambers;

a normally closed automatic valve within each first chamber below said bottom plates respectively connected to said water pipe;



an upright spray support pipe connected to each valve;

a horizontal closed end sprayer pipe intermediate its ends mounted upon and in communication with said spray support pipe and extending along the length of said case centrally thereof;

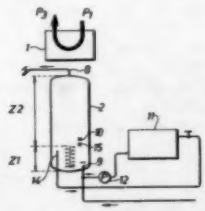
there being opposed pairs of rows of spray outlets extending from opposite sides of said spray pipe outletting into said spray chamber for washing and rinsing said grates, tubing and interior surfaces of said case and for automatic withdrawal through said drain pipe;

said automatic valves being adapted to be energized successively for the progressive washing of said cases.

4,416,121
DEVICE FOR THE RECOVERY OF HEAT

Bertil Sjöstedt, Flen; Gunnar Carlsson, and Hans Lindholm, both of Katrineholm, all of Sweden, assignors to Elektro Standard AB, Katrineholm, Sweden

PCT No. PCT/SE81/00126, § 371 Date Nov. 18, 1981, § 102(e) Date Nov. 18, 1981, PCT Pub. No. WO81/03219, PCT Pub. Date Nov. 12, 1981
PCT Filed Apr. 24, 1981, Ser. No. 324,353
Claims priority, application Sweden, Apr. 30, 1980, 8003303
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.6 **10 Claims**



1. A device for supplying heat in a building, comprising a compressor driven heat pump (1), the vaporizer (4) of which is adapted to receive heat from a heat source, and the condenser (6) of which is situated in the lower part (Z1) of a container (2)

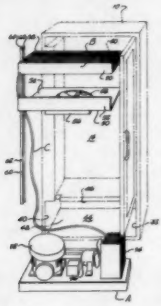
for consumption hot water, a supply connection (9) for cold water being likewise situated in said lower part (Z1) of the container (2), whereas the hot water discharge connection (8) is situated in the upper part of the container (2), and means for transferring heat from said lower part (Z1) of the container (2) to said building, said heat transfer means comprising a liquid circulation circuit (14, 12, 11, 16, 9) in heat transferring contact with the water inside said container (2) in the region of said condenser (6), said liquid circulation circuit being arranged to emit heat to the building outside said container (2) via at least one liquid circulation element (16, 11, 23).

4,416,122

UNITARY REMOVABLE REFRIGERATION SYSTEM AND COOLER

Robert A. Johnson, Spartanburg, S.C., assignor to Tannetics, Inc., Erie, Pa.

Filed May 3, 1982, Ser. No. 373,893
Int. Cl.³ F25D *19/02*
U.S. Cl. 62—448 7 Claims



1. A refrigerated cabinet for merchandising and dispensing beverages and the like containers from vertically spaced shelves in a cabinet interior comprising:

a vertical cabinet having a cabinet front which is open to said cabinet interior;

a refrigeration unit carried in said cabinet including a compressor, an evaporator, and refrigerant tubing connecting said compressor and evaporator in fluid communication;

lower compartment means carried by said cabinet having an open front receiving said compressor for installation and removal from said cabinet front effectively isolating said compressor in said cabinet from said cabinet interior;

upper compartment means housing said evaporator carried in an upper portion of said cabinet, said evaporator being installable and removable from said upper compartment means from said cabinet front;

means channeling said refrigerant tubing from said compressor to said evaporator adjacent a front opening of said cabinet interior; and

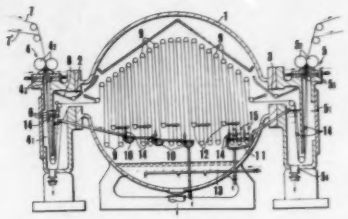
said compartment means and channeling means facilitating removal and replacement of said refrigeration unit from the front of said cabinet for servicing without need of removing said containers from said shelves or moving said cabinet.

4,416,123

APPARATUS FOR WET HEAT TREATING A TEXTILE PRODUCT

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Aug. 19, 1981, Ser. No. 294,388
Claims priority, application Japan, Sep. 16, 1980, 55-128399; Oct. 17, 1980, 55-145517; Oct. 17, 1980, 55-145518; Nov. 18, 1980, 55-162240
Int. Cl.³ D06B *3/12, 23/18*
U.S. Cl. 68—5 E 4 Claims



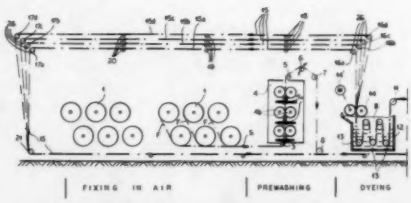
1. A high pressure steamer for wet heat treating a textile product continuously, comprising a steamer body having an inlet on one side and an outlet on the opposite side, an inlet side seal mechanism connected to and located outwardly from the inlet of said steamer body, an outlet side seal mechanism connected to and located outwardly from the outlet of said steamer body, said inlet and outlet side seal mechanisms arranged for maintaining high pressure and high temperature wet heat conditions in said steamer body, said inlet side seal mechanism including a liquid seal tank for holding a treating solution for immersing the textile product therein, means in said inlet side seal mechanism for guiding the textile product downwardly through said liquid seal tank and then upwardly to the inlet of said steamer body, at least one liquid application tank in said steamer body, means for conveying the treating solution from the liquid seal tank to said at least one liquid application tank for immersing the textile product therein.

4,416,124

SHEET-DYEING APPARATUS

Eckard Godau, Kronthaler Weg 10, 6238 Hofheim (Tanus), Fed. Rep. of Germany

Filed Dec. 22, 1980, Ser. No. 218,817
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951695; Dec. 4, 1980, 3045646; Dec. 4, 1980, 3045647
Int. Cl.³ D06B *23/00*
U.S. Cl. 68—9 11 Claims



1. A system for dyeing a textile strand in the form of a sheet of parallel filaments, said system comprising:

a vet containing a bath of a liquid dye;

first guides in said vat defining a first path section therein entirely underneath the surface of said bath;

second guides outside said vat defining a second path section passing through a gas-treatment location, said first and second path sections together forming an annular path;

supply means for feeding said strand from a supply to said path upstream of said first path section relative to a predetermined direction of travel around said path; and

drive means for conducting said strand in at least two separate passes around said annular path for contacting said strand with said liquid dye bath in each of said passes and for passing said strand through said gas-treatment location in each of said passes, said passes of said strand being generally coplanar and interleaved in said first path section, said second guides including two separate sets of second guides defining two separate horizontal second path subsections together constituting said second path section, said strand passing over one of said second path subsections on one of said passes and over the other second path subsection on the other of said passes, said path formed by said first and second path sections lying generally in an upright plane generally perpendicular to said array of filaments and generally parallel to their direction of travel in said path, said second guides including deflecting rollers positioned approximately in the middle of said portions and deflecting said strand therein so each pass is of the same length.

4,416,125

FEED DEVICE EQUIPMENT FOR LETTING OUT HIDES

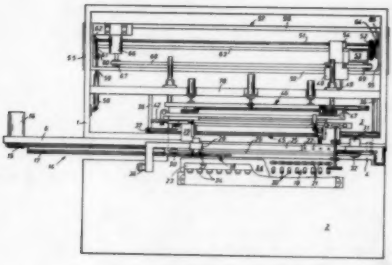
Herbert Dietrich, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Apr. 2, 1982, Ser. No. 364,898

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1981, 3113836

Int. Cl.³ C14B *15/00, 17/00*

U.S. Cl. 69—21 **10 Claims**



1. A device for letting out a hide to be cut and sewn at seam areas extending in a longitudinal direction and at an angle to an edge of the hide, comprising:

a pair of clamping jaws for clamping the hide at each seam area;

jaw drive means for moving the jaws laterally of the longitudinal direction to clamp the hide at each seam area;

a parting sword movable between the jaws and extending in a longitudinal direction, said parting sword including a hide hair divider for parting hair on the hide to form a furrow therein;

sword drive means connected to said printing sword for moving said sword in the longitudinal direction to form the furrow and upwardly to push the hide at each seam area between said jaws;

cutting means for cutting the seam area after it is clamped by said clamping jaws;

backspacing means connected to at least one of said jaws for moving said jaws with respect to each other for a first selected amount in the longitudinal direction;

a sewing machine for sewing the seam area after said jaws are moved by said backspacing means and the seam is cut by said cutting means;

a seam gripper for gripping the seam after it is sewn by said sewing machine and moving the seam downwardly of said clamping jaws and laterally of said longitudinal direction by a second selected amount corresponding to a distance between adjacent seam areas on the hide; and

gripper drive means for moving said seam gripper downwardly and transversely of the longitudinal direction for repositioning the hide to bring an additional seam area thereof into alignment with said parting sword.

9. A method of letting out a hide to be cut and sewn at a plurality of equally spaced seam areas comprising:

placing the hide hair side down on a table having a slit therein extending in a longitudinal direction parallel to the seam areas to be cut and sewn;

passing a parting sword through said slit and into contact with the hide for parting hairs of the hide in the vicinity of the slit and forming a furrow in the hide hairs;

providing a pair of clamping jaws over the hide having a space therebetween aligned with the slit;

pushing the hide upwardly through the space between the jaws to form a seam area;

moving the jaws together to clamp the hide in the seam area;

cutting the hide in the seam area;

backspacing one of said jaws with respect to the other in the longitudinal direction to offset the cut hide in the seam area thereafter sewing the hide in the seam area;

gripping the hide at the sewn seam area;

moving the jaws apart to unclamp the seam area;

moving the gripped seam area downwardly and laterally of said slit in a direction transverse to said longitudinal direction by an amount corresponding to the equal space between seam areas; and

using the parting sword to produce an additional furrow in the hide in an additional seam area.

4,416,126

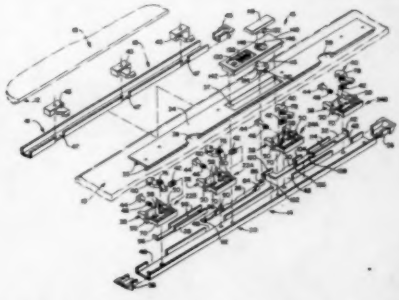
LUGGAGE LATCHING SYSTEM

Richard C. Remington, Pompton Plains, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Filed Dec. 10, 1980, Ser. No. 214,883

Int. Cl.³ E05B *65/52, 37/02*

U.S. Cl. 70—71 **35 Claims**



1. A latching system for a luggage article including a plurality of spaced latches each mounted for movement between a hasp-engaging position and a hasp-disengaging position, a latch actuator, drive means connected between said actuator and each latch for moving the latches in unison from their respective hasp-engaging to their respective hasp-disengaging positions responsive to movement of the actuator from a rest position, biasing means for returning said latches to the respective hasp-engaging positions upon release of the actuator and, through said drive means, for returning the actuator to the rest

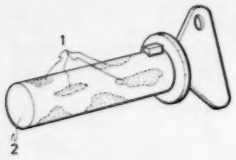
position, each of said latches being movable from its hasp-engaging position to its hasp-disengaging position independently of the drive means when the latch is disengaged from a hasp whereby the hasp may be reengaged with the latch while the actuator is retained in the rest position.

4,416,127

MAGNETO-ELECTRONIC LOCKS

Mariano Gomez-Olea Naveda, Vuelta del Castillo, 3 - 5° A, Pamplona, Spain

Filed May 28, 1981, Ser. No. 267,859
Claims priority, application Spain, Jun. 9, 1980, 492254
Int. Cl.³ E05B *19/00, 47/00*
U.S. Cl. 70—276 **19 Claims**



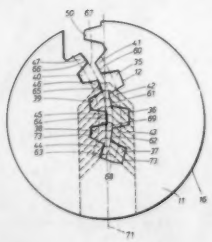
1. In an magnetoelectronic lock comprising a key body having a magnetic combination, a receiver of the key body in the interior of which there are arranged magnetic detectors, a bolt, and an electronic circuit device connected between the bolt and the detector, the improvement comprising: positive and negative magnetisation means which cooperate, depending on the position thereof, in the electric conduction, opening, closing or blocking of an electronic circuit including an electric opening pulse of a gate; a means for determining the electric continuity both in the key and in the receiver thereof; an electric derivation means for opening the code; passive positive and negative relay means in combination with positive and negative magnetic elements; positive and negative magnetic means whose potentials act on the passive relays in the contact threshold; positive and negative magnetic means which, in combination by proximity to the passive relays, act on them with an opposite polarity maintaining them static with respect to their means potential, changing the conduction state thereof when magnetic elements having a higher potential are juxtapositioned; and a multiple contact connector means capable of being combined with the key.

4,416,128

CYLINDER LOCK

Wilfried Steinbrink, Heiligenhaus, Fed. Rep. of Germany, assignor to C. Ed. Schulte GmbH, Velbert, Fed. Rep. of Germany

Filed Jun. 9, 1981, Ser. No. 271,845
Int. Cl.³ E05B *19/02, 27/02*
U.S. Cl. 70—364 A **7 Claims**



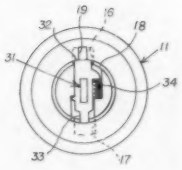
1. A cylinder lock comprising a housing; a cylinder rotatably arranged in said housing and having a key passage with two lateral walls having respectively first and second pluralities of longitudinal ribs for lateral profile varying, the longitudinal ribs of said first and second pluralities of ribs having end faces lying respectively on two limiting lines which define therebetween a uniformly extending strip-like gap in said key passage, said cylinder also having a plurality of openings; a plurality of pins arranged in said openings of said cylinder and having axes which define a longitudinal center plane; and a substantially flat key insertable into said key passage of said cylinder and having a front part provided with a plurality of notches cooperating with said pins in said cylinder, said key having first and second lateral faces provided respectively with first and second pluralities of longitudinal grooves for receiving said longitudinal ribs of said key passage of said cylinder; the longitudinal grooves of said first and second pluralities of grooves having bottom faces lying respectively on two further limiting lines which define therebetween a uniformly extending strip in said flat key, said strip-like gap of said key passage and said strip of said flat key being arcuate at least in the height region of said notches of said flat key, and said longitudinal center plane defined by said axes of said pins cutting through the arc of said strip-shaped gap and said strip as a secant, so that the arc extends substantially identically far at both sides of said longitudinal center plane.

4,416,129

CYLINDER LOCK WITH KEY REMOVABLE PLUG

Robert P. Thimot, Marlboro, Mass., assignor to Hudson Lock, Inc., Hudson, Mass.

Filed Jun. 4, 1981, Ser. No. 270,501
Int. Cl.³ E05B *15/14, 29/02*
U.S. Cl. 70—369 **11 Claims**



1. A cylinder lock comprising:

a shell defining a plug cavity, a plurality of locking shell tumblerways, and a control shell tumblerway;

a plug received by and rotatable in said plug cavity between locked and open positions and defining a plurality of locking plug tumblerways alignable with said locking shell tumblerways, a control plug tumblerway alignable with said control shell tumblerway, and a keyway for receiving keys;

a locking tumbler positioned in each of said locking plug tumblerways, each of said locking tumblers being biased into an active position and movable into an inactive position by a proper key in said keyway, and wherein said locking tumblers prevent rotation of said plug when in said active positions and allow rotation thereof when in said inactive positions;

a control tumbler retained by said control plug tumblerway and biased into a latched position and movable into a release position by a control key in said keyway;

blocking means axially engaging said control tumbler with said plug in said locked position so as to prevent axial withdrawal thereof from said shell;

stop means preventing movement of said control tumbler into a position that eliminates said axial engagement between said blocking means with said plug in said locked position; and

abutment means shaped and arranged with said plug in said open position to prevent axial withdrawal thereof with

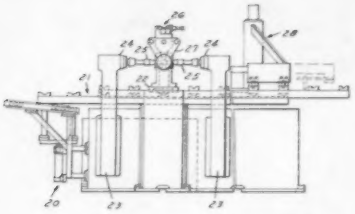
said control tumbler in said latched position and to permit axial withdrawal thereof with said control tumbler in said release position.

4,416,130

PULSING IMPACT STRAIGHTENER

Edward E. Judge, Jr., Lansing, Mich., assignor to Industrial Metal Products Corporation, Lansing, Mich.

Filed Mar. 20, 1981, Ser. No. 245,890
Int. Cl.³ B21K *1/08*
U.S. Cl. 72—10 **42 Claims**



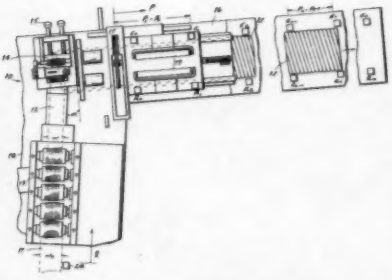
1. Elongated production workpiece straightener characterized by means for gauging magnitude and plane of maximum workpiece distortion, means for peening the workpiece surface, and programmable means responsive to said gauging means for automatically controlling the application of said peening on the concave side of said plane of distortion to effect workpiece straightening through compressive elongation of workpiece surface fibers on said concave side.

4,416,131

PROCESS AND APPARATUS FOR MONITORING LENGTH AND DIAMETER OF HELICAL CORRUGATED PIPE

Walter Z. Davis, Spokane, Wash., assignor to Helical Control Systems, Inc., Spokane, Wash.

Filed Jan. 6, 1982, Ser. No. 337,411
Int. Cl.³ B21C *37/12*
U.S. Cl. 72—12 **14 Claims**



1. A process for monitoring the diameter of a helical corrugated metal pipe while the pipe is being formed from a strip of corrugated sheet metal having a known width (w), comprising:

continuously feeding the strip of sheet metal to a corrugated pipe forming station at a feed angle with respect to an intended pipe forming axis;

continuously measuring the length (l) of the strip of sheet metal being fed to the corrugated pipe forming station;

continuously corrugating the strip of sheet metal and continuously forming the corrugated sheet metal into a corrugated pipe at the corrugated pipe forming station and directing the continuously formed corrugated pipe substantially coaxially along the intended pipe forming axis;

sensing the presence of a section of the formed corrugated pipe as it passes a first reference location along the intended pipe forming axis;

sensing the presence of the section of the formed pipe as it passes a second reference location that is spaced a desired distance (p) downstream of the first reference location;

determining the pipe diameter value of the pipe section as a function of sheet metal width (w), pipe section length (p), and length (l) of sheet metal strip used to form the pipe section; and

recording the determined pipe diameter value.

4,416,132

METAL FORMING LUBRICANT AND METHOD OF USE THEREOF

Donald J. Sargent, West Lafayette, Ind., assignor to E/M Lubricants, Inc., West Lafayette, Ind.

Division of Ser. No. 276,937, Jun. 24, 1981. This application Mar. 25, 1983, Ser. No. 479,017
Int. Cl.³ B21B *45/02*
U.S. Cl. 72—41 **10 Claims**

6. In a method of forming two piece cans from black plate steel in which a blank is produced from the black plate steel and the blank is subjected to drawing and ironing operations to produce an elongated can body, the improvement comprising the additional steps of:

a. prior to the drawing operation, coating the portion of the black plate steel which ultimately becomes the exterior of the can body with a first coating lubricant, said first coating lubricant comprising 2.5 to 3.75 percent terpene phenolic resin, 0.3 to 2.5 percent esterified styrene maleic anhydride, 2.5 to 3.75 percent synthetic polymethylene wax, 0.3 to 2.0 percent unsaturated fatty acid, 0.3 to 2.0 percent amines, 0.05 to 0.5 percent potassium hydroxide, 24.0 to 32.0 percent of a compound comprising an anion selected from Group VIb of the Periodic Table and a cation selected from Group VIa of the Periodic Table, 8.5 to 11.5 percent synthetic wax emulsion and the remainder distilled water;

b. drying the first coating lubricant;

c. coating the portion of the black plate steel which ultimately becomes the interior of the can body with a second coating lubricant, said second coating comprising 5.0 to 20.0 percent synthetic wax emulsion and the remainder distilled water; and

d. after the ironing operation, removing said first and second coating lubricants by washing the elongated, enclosed can body in a slightly alkaline solution.

4,416,133

AUTOMATIC MACHINE FOR FINISHING COOKWARE BODY BLANKS

Edward A. Doyle, Sheboygan, Wis., assignor to E. A. Doyle Manufacturing Corporation, Sheboygan, Wis.

Filed Oct. 28, 1981, Ser. No. 315,667
Int. Cl.³ B21D *39/08*
U.S. Cl. 72—58 **14 Claims**

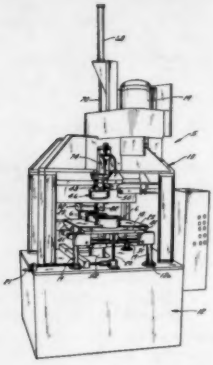
1. A machine for performing a finishing operation upon a metal container blank having a circular bottom wall and an upright side wall that are concentric to an axis of the blank, said operation requiring rotation of the blank about its axis relative to a tool that engages the blank, said machine being characterized by:

A. a tail stock having a substantially horizontal top surface, said tail stock being freely rotatable about an upright station axis and being movable upward from and downward to a lowered position in which its said top surface is at a predetermined level;

B. a conveyor arranged for transporting a blank substantially horizontally onto and off of said tail stock when the same

is in said lowered position and whereby the blank is delivered to the tail stock with the bottom wall of the blank resting on said top surface and with the axis of the blank substantially coinciding with said station axis;

C. a driver head confined to rotation about said station axis at a location substantially above said level, to be clear of blanks transported by the conveyor, said driver head having a bottom surface coaxially engageable with the bottom wall of a blank for imparting rotation thereto;



D. drive means for continuously rotating said driver head; and

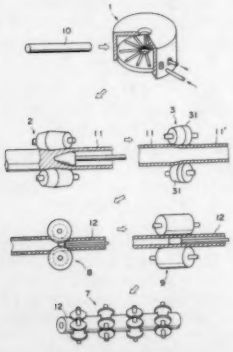
E. lift means for raising said tail stock above its lowered position and clampingly engaging the bottom wall of a blank thereon against said bottom surface of the driver head, so that the blank can be rotated by the driver head for performance of said operation.

4,416,134

PROCESS FOR MANUFACTURING SEAMLESS METAL TUBES

Chihiro Hayashi, Amagasaki, Japan, assignor to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 9, 1981, Ser. No. 281,901
Claims priority, application Japan, Feb. 17, 1981, 56-22540
Int. Cl.³ B21B *19/04*
U.S. Cl. 72—68 **14 Claims**



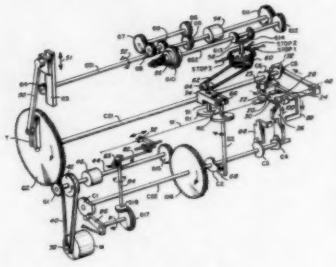
1. A process for manufacturing seamless metal tubes which comprises the steps of piercing a billet in a piercing mill to form a hollow shell having a wall thickness to outer diameter ratio of 5 to 15% and thereafter reducing the outer diameter of the said shell by rolling to equalize the wall thickness by means of a cross-roll type rotary mill having 3 or 4 rolls arranged around a pass line without any internal tools, the axes of said rolls being inclined so that the shaft ends on the shell-entry side of the rolls are at a cross angle γ from the pass line, said axes being inclined at a feed angle β so as that the shaft ends on either side of the rolls face the peripheral direction on the same side of the shell being worked, said cross angle γ being negative and said feed angle β being as small as possible.

4,416,135

WIRE COILING MACHINE

Frank S. Russell, Northboro, Mass., assignor to Sleeper & Hartley Corp., Worcester, Mass.

Filed Sep. 10, 1981, Ser. No. 300,758
Int. Cl.³ B21F *3/027, 11/00, 35/02*
U.S. Cl. 72—130 **24 Claims**



1. A wire coiling machine comprising:

means for receiving wire adapted to be formed into a spring, and extending along a wire feed path,

first feed means disposed along the feed path and adapted to provide bi-directional wire movement,

second feed means also disposed along the feed path and adapted to provide uni-directional wire movement,

first control means for selectively controlling the first feed means to provide, during a first forming operation, wire movement toward a work station, temporary interruption of movement, followed by wire movement away from the work station,

second control means for selectively controlling the second feed means to provide, during a second forming operation, selective wire feed to the work station,

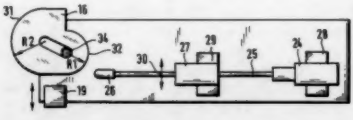
and means supported at the work station including control means therefor for performing bending, coiling or the like on the wire to complete formation of said spring.

4,416,136

PIPE-BENDING MACHINE

Rigobert Schwarze, Olpener Str. 460-474, 5000 Köln 91, Fed. Rep. of Germany

Filed Sep. 2, 1981, Ser. No. 298,753
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1980, 3033300
Int. Cl.³ B21D *7/04*
U.S. Cl. 72—157 **12 Claims**



1. A pipe-bending machine comprising a stand, a bending

table supported for rotation relative to the stand, an adapter sleeve for clamping a portion of the processed pipe, a sliding carriage mounted for free reciprocating movement on the stand and connected to the adapter sleeve, a bending form mounted on an upper surface of said bending table and having at least two curved peripheral sections each defining a center of its curvature, the form being shiftable on said upper surface of said bending table in a radial direction relative to the axis of rotation of the table, from a first working position in which the axis of rotation of the table coincides with one center of curvature of the form into another working position in which the axis of rotation of the table coincides with the other center of curvature of the form, means for arresting the form in the selected working position, and clamping means arranged on the bending table for movement against the selected peripheral section of the bending form to clamp a portion of the pipe to be bent.

4,416,137

ROLL CONSTRUCTION

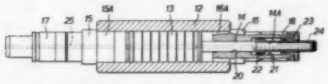
Robert Marshall, North Anston, England, assignor to Davy-Loewy Limited, Sheffield, England

Filed Dec. 2, 1981, Ser. No. 326,537

Claims priority, application United Kingdom, Mar. 20, 1981, 8108859

Int. Cl.³ B21B *31/32*

U.S. Cl. 72—243 **4 Claims**



1. A rolling mill comprising at least four rolls, at least one of said rolls having axial compliance and comprising:

a sleeve having a bore therethrough and forming the barrel of said roll;

first and second end members secured on said bore at respective ends of said sleeve, at least one of said end members having therethrough a passage with a diameter significantly less than the diameter of said bore;

an arbor located within said bore between said end members and axially movable within said bore to adjust the axial compliance of said roll;

a roll neck integral with each said member, for mounting said roll in a rolling mill, one said neck having therein a cylinder-forming recess; and

adjustment means for said arbor, said means including a piston located in said recess and connection means operatively attached between said arbor and said piston and passing axially through said passage of said one end member.

4,416,138

EXTRUSION PRESS DIE CHANGE ASSEMBLY

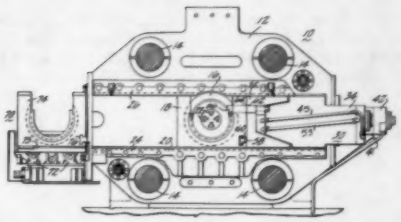
Howard W. Freese, Rushville, and Danil Lukach, Rochester, both of N.Y., assignors to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 127,398, Mar. 5, 1980, abandoned. This application Dec. 24, 1981, Ser. No. 334,311

Int. Cl.³ B21C *35/04*

U.S. Cl. 72—263 **1 Claim**

1. An extrusion press having a platen against which a die is supported for extrusion of material therethrough; a holder for the die having an open side through which the die is movable and mounted for sliding movements along the platen between an extrusion position and a die transfer station; a two part assembly mounted on the platen for sliding movements with the holder, the assembly including a primary slide containing a main cylinder and a secondary cylinder; a main piston having a rod extending in one direction through one end of the main cylinder and being secured to the platen; a secondary piston having a rod extending in the opposite direction through the opposite end of the secondary cylinder, the secondary piston rod being fixed to a secondary slide forming part of the assembly and being detachably secured to the holder; the cylinders being arranged so that when the main and secondary pistons and rods are fully retracted in their respective cylinders, the holder and die are located in extrusion position, and when the



main and secondary pistons and rods are fully extended, the secondary slide is moved away from the primary slide and the holder and die are located at the transfer station; the holder having an open side through which the die is movable, the holder also having a bore through which a finger attached to the primary slide projects into retaining engagement with a die in the holder, the finger being retracted to release the die when the secondary slide is moved away from the primary slide.

4,416,139

GUIDING A MANDREL OR PUNCH FOR PIERCING OR COLD-EXTRUSION

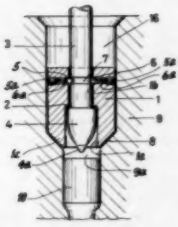
Heinrich Hesse; Anton Merkler; Siegfried Gross, and Gerhard Radtke, all of Bielefeld, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 1, 1981, Ser. No. 268,801

Claims priority, application Fed. Rep. of Germany, May 8, 1980, 3017821

Int. Cl.³ B21C *23/20, 26/00*

U.S. Cl. 72—267 **4 Claims**



1. Device for guiding a punch or mandrel in a die cavity, the punch or mandrel having a stem and a head on the stem, the head having a larger diameter than the stem, defining a shoulder accordingly, comprising:

annular means receiving a portion of the stem and of the head and having a shoulder by means of which the annular means can be seated on the shoulder of the head, the annular means including a first front end member, and a second rear member displaceably connected to the front member;

said die cavity having a centering surface, said front member having a matching front end surface for being seated and centered on said centering surface, thereby centering the mandrel or punch; and

releasable lock means locking the annular means to the stem, the front member including means for unlocking the locking means, for being released upon advance of the stem and upon abutment of said front end surface and said centerin surface.

4,416,140

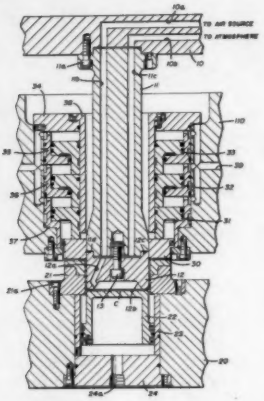
CAN REMOVAL METHOD FOR USE WITH A DOUBLE ACTION CUPPER

Joseph D. Bulso, Jr., and William R. Lewers, both of Canton, Ohio, assignors to Redicon Corporation, Canton, Ohio

Division of Ser. No. 171,905, Jul. 24, 1980, Pat. No. 4,343,173. This application Jan. 11, 1982, Ser. No. 338,213

Int. Cl.³ B21D *45/00*

U.S. Cl. 72—345 **2 Claims**



1. A method of forming a container from sheet stock in a double acting press comprising the steps of:

(A) closing the press and blanking the stock;

(B) forming the container with a draw horn and forming die;

(C) opening the press and ejecting the formed container from the forming die while simultaneously withdrawing the draw horn;

(D) initially directing pressurized air only against at least part of an interior wall surface of the formed container to expel it from the press as the container reaches the die line and the draw horn clears the container.

4,416,141

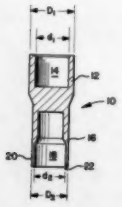
METHOD AND APPARATUS FOR FORMING AN ELECTRICAL CONNECTOR

Russell A. Nippert, Delaware, Ohio, assignor to The Nippert Company, Delaware, Ohio

Filed Jan. 11, 1982, Ser. No. 338,804

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—345 **14 Claims**



1. A method of forming an electrical connector having a first cylindrical portion with a first outside diameter, said first cylindrical portion defining a first cylindrical recess therein, and a second cylindrical portion with a second outside diameter, said second cylindrical portion defining a second cylindrical recess therein, said second outside diameter being less than said first outside diameter, comprising the steps of:

(a) forming a cylindrical billet of ductile metal, said cylindrical billet having an outer diameter substantially equal to said first diameter,

(b) placing said billet in a first die and forming an intermediate billet by back extruding said first portion of said connector over a punch cooperating with said die, while forward extruding said billet in said die to form a portion of reduced diameter, said portion of reduced diameter having an outside diameter approximately equal to said second outside diameter,

(c) placing said intermediate billet in a movable die section, said movable die section have an upper portion of an inside diameter substantially equal to said first diameter and a lower portion of an inside diameter substantially equal to said second diameter, said first cylindrical portion of said connector being positioned in said upper portion of said die and said portion of reduced diameter being positioned in said lower portion of said die,

(d) moving said intermediate billet and said movable die section downward from an initial position by means of a finish punch, said finish punch contacting said intermediate billet and being received within said first cylindrical recess, downward movement of said movable die section forcing said portion of reduced diameter over a stationary punch within said die such that said portion of reduced diameter is forward extruded, thereby forming said second cylindrical portion and said second cylindrical recess therein and producing said connector,

(e) retracting said finish punch from said connector, and

(f) ejecting said connector from said movable die section by raising said stationary punch with respect to said movable die section.

4,416,142

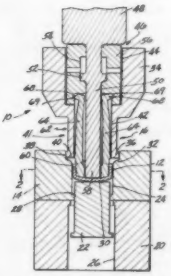
APPARATUS FOR SIMULTANEOUSLY FORMING A CAP MEMBER WITH INTERNAL THREADS

Thomas Thorne-Thomsen, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 31, 1981, Ser. No. 297,813

Int. Cl.³ B21D *22/20, 53/24*; B21K *1/56*

U.S. Cl. 72—348 **5 Claims**



1. An apparatus for forming a cap-like memberfrom a blank of material comprising:

die means for shaping the cap-like member;

plunger means co-acting with the die means for simultaneously forming the member with internal threads therein, said plunger means including a movable punch operator having an opening with a substantially curved slot at one end; and

a collapsed, segmented punch having a plurality of segments separated by longitudinal slots, each of said segments having a lip on one end being pivotally received within said curved slot for supporting said segment, and one or more of said segments further having external threads on a second end thereof;

a reciprocating rod extending through said plunger having a plurality of splines at one end projecting into each of said longitudinal slots, said rod fastening the lips of said segments within said curved slot;

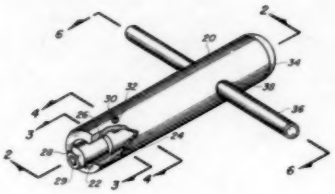
said segments being pivoted about said lips between a collapsed position whereby said segments are movable inwardly toward said rod corresponding to rod movement in one direction and to an expanded position wherein the rod movement is in a second direction so that the rod end having said splines thereon engages the second end of said segments and forces them outward resulting in a solid plunger to push said blank into the die means and form said cap having substantially the configuration of said die means.

4,416,143

CONNECTOR STRAIGHTENING TOOL

Claude H. Fouroux, 8632 Cypress Ave., Cypress, Calif. 90630, and Craig W. Boardman, 393 Sunrise Cir., Costa Mesa, Calif. 92627

Filed Sep. 27, 1982, Ser. No. 424,355
Int. Cl.³ B21D *3/14*
U.S. Cl. 72—479 **9 Claims**



1. An improved hand held electrical connector shell straightening tool comprising:

(a) a body having a first and second end, said first end having a bore therein;

(b) a hollow cylindrical plug having a stepped shoulder and a tapered end, the extended portion of said shoulder being of a diameter to be insertably received within said bore in the first end of said body and defining a cavity between said plug and said bore for forceably receiving said electrical connector shell therebetween straightening said shell to conform to the inside diameter of the bore and simultaneously the outside of said cylindrical plug with the internal hollow portion of said cylinder providing clearance for projections within said electrical connector;

(c) means to attach said plug within said bore of the body for securing therewith; and,

(d) gripping means appended to said body defining raised projections for hand manipulation thereof.

4,416,144

APPARATUS FOR EVALUATING SLIDER FLYING DYNAMICS

Tsu F. Chen, Dresher, and Juan M. Gottschalk, Elkins Park, both of Pa., assignors to Sperry Corporation, New York, N.Y.

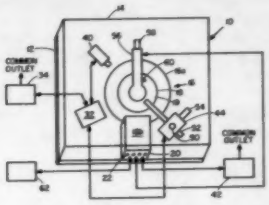
Filed Apr. 21, 1982, Ser. No. 370,448
Int. Cl.³ G01M *19/00*; G01N *3/30, 19/00*
U.S. Cl. 73—12 **17 Claims**

1. A test apparatus comprising:

a memory disk sample;

a disk drive supporting said sample;

a head assembly mounted adjacent said disk sample, said head assembly having a slider head in proximity with said disk sample;



a hammer assembly mounted adjacent said disk sample, said hammer assembly having a hammer movable into engagement with said disk sample; and

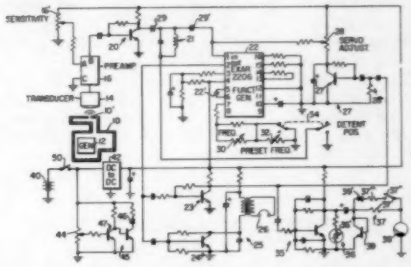
means for controlling said hammer for making predetermined dents in said disk sample.

4,416,145

ULTRASONIC LEAK DETECTING METHOD AND APPARATUS

Mark Goodman; John R. Zeno, both of New York, and Marty Borruso, Brooklyn, all of N.Y., assignors to UE Systems, Inc., New York, N.Y.

Filed Feb. 10, 1982, Ser. No. 347,584
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—40.5 A **31 Claims**



1. Apparatus for indicating the presence of ultrasonic energy comprising:

an ultrasonic transducer means for converting ultrasonic energy into electrical energy having a related ultrasonic frequency;

an amplifier means for amplifying the electrical energy produced by said transducer means to produce an amplified ultrasonic signal;

a heterodyne means for translating the frequency of the amplified ultrasonic signal into the audio frequency range by modulating it with a carrier frequency signal whose frequency differs from the ultrasonic frequency by a frequency within the audio range, said heterodyne means including a carrier frequency signal generator and a suppressed-carrier amplitude modulator means for modulating said amplified ultrasonic signal with said carrier signal to produce an output audio frequency signal related to the amplified ultrasonic signal; and

an indicator means responsive to the amplitude of the audio frequency signal for indicating an output level related to the level of the ultrasonic energy.

22. In a method of detecting small openings in an otherwise

closed container, involving the steps of pressurizing the container with a gas, detecting the existence of ultrasonic energy outside the container due to the pressure of the gas through the opening with an ultrasonic detector that converts the ultrasonic energy into energy in the audio range, and locating the origin of the ultrasonic energy outside the container by passing the ultrasonic detector over the outer surface of the container to locate the position at with the largest audio energy signal is obtained, the improvement comprising the step of covering the outer surface of the container with a layer of a liquid having a surface tension such that the pressure of the gas through small openings in the container causes the formation and bursting of bubbles in the layer of liquid at that location, said bubbles having a size such that their bursting generates ultrasonic energy.

25. An ultrasonic energy generator comprising:

an oscillator circuit means for producing an electrical oscillation in a narrow ultrasonic band of frequencies, said oscillator circuit including a feedback path with a piezoelectric crystal, said crystal having a resonant frequency in said narrow band of frequencies and converting the electrical oscillation signals in the feedback path into ultrasonic energy; and

sweep means for causing the output of said oscillator to vary within said narrow band of frequencies at a periodic frequency rate that is no higher than the upper limit of the audio range.

29. An ultrasonic transducer for converting ultrasonic energy into electrical energy having a selected ultrasonic frequency comprising:

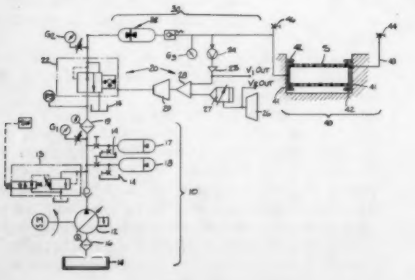
at least two piezoelectric crystals electrically connected in series and spaced adjacent each other on a generally planar surface such that both are exposed to the ultrasonic energy, the degree of curvature of said planar surface being related to the distance from said surface for which said transistor means is focused to received ultrasonic energy; and

an amplifier means including an input field-effect transistor, said crystals being connected in series between a gate terminal of said field-effect transistor and a common reference level, said input field-effect transistor being biased to have a high impedance between the gate terminal and the common reference level sufficient to avoid loading the series arrangement of crystals.

4,416,146
PLASTIC PIPE TESTER WITH FEEDBACK CONTROLLED PRESSURIZER

Roy A. Ambrose, 7854 S. Johnson Ct., Littleton, Colo. 80127

Filed Mar. 5, 1982, Ser. No. 355,032
Int. Cl.³ G01M 3/28
U.S. Cl. 73—49.5 4 Claims



1. An apparatus for testing a sample of plastic pipe by internally pressurizing said sample in a controlled manner, comprising:

(a) a source of hydraulic pressure;

(b) means for conducting at least a portion of said hydraulic pressure to said sample to internally pressurize said sample;

(c) a pressure monitoring means for generating a first electrical signal proportional to the hydrostatic pressure within said sample;

(d) a function generator for generating a second electrical signal proportional to the desired hydrostatic pressure within said sample as a function of time;

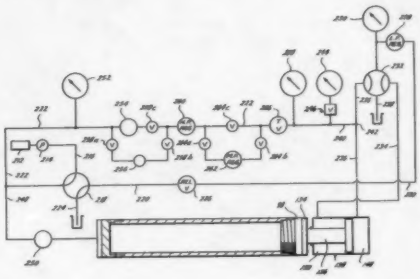
(e) a means for generating a third electrical signal proportional to the difference between said first electrical signal and said second electrical signal; and

(f) a means for controlling flow of hydraulic fluid from said source to said means for transmitting in response to said third electrical signal.

4,416,147
APPARATUS AND METHOD FOR HYDROSTATICALLY TESTING PIPE

Brian B. Hasha, 17211 Ash Butte, Houston, Tex. 77090

Filed Jul. 15, 1981, Ser. No. 283,484
Int. Cl.³ G01M 3/28
U.S. Cl. 73—49.6 22 Claims



1. An improved testing apparatus for hydrostatically testing threaded pipe of the type having

a frame for containing a threaded pipe;

a first threaded test plug rotatably mounted on said frame having a threaded portion in the form of the male end of a threaded pipe for threadably sealing the female end of a threaded pipe contained within said frame;

a second threaded test plug rotatably mounted on said frame having a threaded portion in the form of the female end of a threaded pipe for threadably sealing the male end of a threaded pipe contained within said frame;

means for introducing test fluid into the interior of said threaded pipe through at least one of the rotatably mounted test plugs sealing the ends of said threaded pipe contained within said frame;

means for containing test fluid within the interior of said threaded pipe;

means for subjecting said test fluid inside said threaded pipe to hydrostatic pressure;

a compression cylinder mounted on said frame having a longitudinally movable compression cylinder piston slidably disposed within said compression cylinder for abutting one of the sealed ends of said threaded pipe; and

a conduit for transmitting said hydrostatic pressure from the test fluid in said threaded pipe to a back chamber of said compression cylinder to urge said compression cylinder piston into contact with said sealed end of said threaded pipe to transmit force from said compression cylinder to the sealed ends of said threaded pipe;

wherein the improvement comprises

means for initiating the transmission of hydrostatic pressure

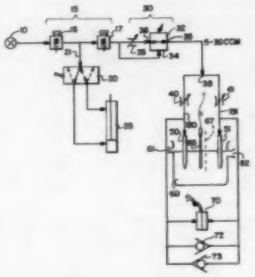
to the back chamber of said compression cylinder when a specific pre-selected value of hydrostatic pressure is exceeded in the test fluid inside said threaded pipe.

4,416,148

SURFACE TENSIOMETER

John P. Klus, Madison; Everett E. Gibbons, Monona; Eric L. Brodsky, Madison, and Victor P. Janule, Sun Prairie, all of Wis., assignors to Madison-Kipp Corporation, Madison, Wis.

Filed Feb. 6, 1981, Ser. No. 232,091
Int. Cl.³ G01N *13/02*
U.S. Cl. 73—64.4 **5 Claims**



1. An apparatus for determining the surface tension of a liquid comprising

a pressure vessel for containing the liquid,

a tube having an orifice positioned below the surface of the liquid,

means for providing a source of gas under pressure to said tube,

means connected between said source of gas and said tube for controlling the bubble rate of the gas to the tube independently of the pressure within said vessel,

means for determining the pressure of the liquid at said orifice,

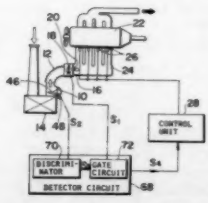
means for measuring the pressure in said tube as compared to the pressure at said orifice as a function of the surface tension of the liquid.

4,416,149

METHOD AND DEVICE FOR DETECTING ENGINE IDLING

Hidetoshi Kitamura, Higashikurume, and Hirohisa Kato, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Feb. 16, 1982, Ser. No. 348,683
Claims priority, application Japan, Apr. 9, 1981, 56-52384
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—118 **5 Claims**



4. A method for detecting engine idling comprising the steps of:

detecting a throttle valve angle position in which throttle valve open angle is less than a predetermined angle;

determining an intake air flow rate;

discriminating whether the determined air flow rate is less than a predetermined value; and

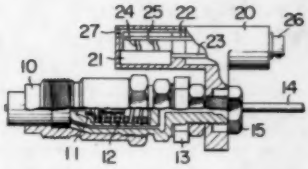
producing a signal indicative of engine idling when the throttle valve is at an open angle less than the predetermined angle and air flow rate is less than the predetermined value.

4,416,150

FUEL INJECTION TIMING DETECTING APPARATUS FOR DIESEL ENGINES

Yoshiyuki Kago, Aichi, and Sigeyuki Akita, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 2, 1981, Ser. No. 307,934
Claims priority, application Japan, Oct. 22, 1980, 55-146978
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—119 A **3 Claims**



1. A fuel injection timing detecting apparatus for Diesel engines comprising:

a preliminarily-magnetized pressure pin disposed within a body of a fuel injection nozzle of a Diesel engine and responsive to a pressure of pressurized fuel supply to be displaced against a spring force of a pressure spring which is in engagement with said pressure pin;

magnetic sensing means disposed outside of said fuel injection nozzle body and fixed to the same to sense a magnetic variation caused by the displacement of said pressure pin, thereby detecting the displacement of said pressure pin; and

a signal processing circuit for amplifying and processing an output signal of said magnetic sensing means, wherein

said magnetic sensing means comprises a flux-gate magnetometer including a toroidal magnetic core, an excitation coil and a sensing coil wound on said magnetic core;

said signal processing circuit includes an excitation circuit including an oscillator circuit for generating an exciting signal having a predetermined frequency and supplied to said excitation coil and a detecting circuit responsive to an output signal of said sensing coil to generate a detection signal indicative of a magnetic variation caused by the displacement of said pressure pin; and

all the component parts of said fuel injection timing detecting apparatus other than said magnetic sensing means are magnetically shielded.

4,416,151

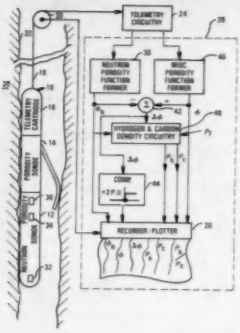
METHOD AND APPARATUS FOR DETERMINING IN SITU HYDROCARBON CHARACTERISTICS INCLUDING HYDROGEN DENSITY

John J. Ullo, Bethel, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 9, 1981, Ser. No. 328,880
Int. Cl.³ E21B *49/00*; G01V *5/14*
U.S. Cl. 73—152 **20 Claims**

1. A method for investigating characteristics of the oil within a geological formation while it remains in situ, said method comprising the steps of:

a. irradiating said geological formation with neutrons;
b. detecting the resultant neutron flux distribution and generating therefrom a first signal indicative of formation porosity and hydrogen density of the fluid in said formation;
c. deriving from said geological formation a second signal indicative of formation porosity but which is less affected



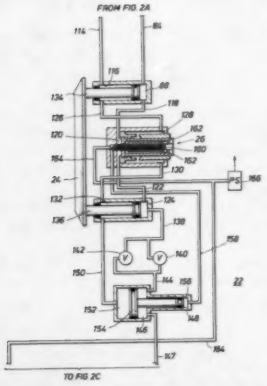
by the nature of the pore fluid, whether it be water or liquid hydrocarbon, than said first signal;
d. combining said first and second signals to generate a signal proportional to the differential therebetween; and
e. determining from said differential signal a signal indicative of the hydrogen density of said oil.

4,416,152

FORMATION FLUID TESTING AND SAMPLING APPARATUS

Herbert C. Wilson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 9, 1981, Ser. No. 310,249
Int. Cl.³ E21B *47/00, 43/00*
U.S. Cl. 73—155 **16 Claims**



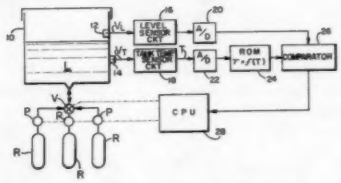
1. Fluid sampling apparatus for obtaining samples of connate fluids from subsurface earth formations traversed by a borehole comprising:
a body member adapted for suspension in a borehole;
first fluid sample collecting means cooperatively arranged on said body member for receiving a first sample of connate fluids;
second fluid sample collecting means cooperatively arranged on said body member for receiving a second sample of connate fluids;
fluid sampling probe means cooperatively arranged on said body member, said probe means having a first fluid flow path comprising a central passage along the longitudinal axis of said probe and a second fluid flow path comprising a plurality of radially spaced longitudinal passages disposed about the longitudinal axis of said probe;
hydraulic fluid power means for telescopically extending said sampling probe means into fluid communication with an earth formation;
first fluid passage means including said first flow path within said sampling probe means providing an unrestricted fluid path between said earth formation and said first sample collecting means; and
second fluid passage means including said second flow path within said sampling probe means providing an unrestricted fluid path between said earth formation and said second sample collecting means.

4,416,153

METHOD OF COMPENSATING A THERMISTOR

Robert C. Williams, Churchville, Pa., assignor to Innovative Medical Systems, Corp., Ivyland, Pa.

Filed Mar. 15, 1982, Ser. No. 358,463
Int. Cl.³ G01F *23/22*
U.S. Cl. 73—295 **6 Claims**



1. A system for controlling the level of liquid applied to a tank which is subjected to temperature variations, comprising:
first thermal sensor means adapted to be mounted within the tank at a predetermined threshold level for producing a first analog signal indicative of absolute temperature at the level;
second thermal sensor means adapted to be attached to the tank for producing a second analog signal indicative of tank temperature;
digital encoder means for converting said first and second analog signals to respective first and second digital data signals;
digital storage means addressed by said second digital data signal and stored with discrete values of a voltage threshold function related to tank temperature for producing an appropriate threshold value upon the address of said second digital data signal; and
a digital comparator connected to said encoder means and said storage means for signaling the discontinuance of liquid flow to the tank when the magnitude of said first digital data signal is equal to or greater than said threshold value.

4,416,154

METHOD FOR MEASURING THE SURFACE AREA OF A SOLID

Arnold M. Schaffer, and Joseph G. Gallagher, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 11, 1981, Ser. No. 291,906
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—571 **8 Claims**

6. A method for measuring the surface area of a solid having

a surface area in excess of about 10 square meters/gram which comprises:

(a) placing said solid in a photoacoustic measuring zone;

(b) surrounding said solid with a coupling gas comprising a gas having a normal boiling point at least about 25° C. below the temperature at which the photoacoustic effect is being measured and a critical temperature not less than about 2° C.;

(c) causing photoacoustic signals to be emitted from said solid;

(d) measuring the intensity of said photoacoustic signals;

(e) removing said coupling gas from said photoacoustic measuring zone;

(f) surrounding said solid with a second coupling gas comprising a permanent gas having a critical temperature not greater than about −73° C.;

(g) causing additional photoacoustic signals to be emitted from said solid;

(h) measuring the intensity of said additional photoacoustic signals;

(i) calculating a ratio of the intensity of said photoacoustic signals to the intensity of said additional photoacoustic signals;

(j) repeating steps (a) and (i) using a second solid of known surface area; and

(k) estimating the surface area of the first solid by making use of the following relationship:

$$SA_1=(SA_2)(R_1/R_2)$$

where SA_1 is the surface area of the first solid, SA_2 is the known surface area of the second solid, R_1 is the ratio of intensities calculated in step (i) which corresponds to the first solid and R_2 is the ratio of intensities calculated in step (i) which corresponds to the second solid.

4,416,155

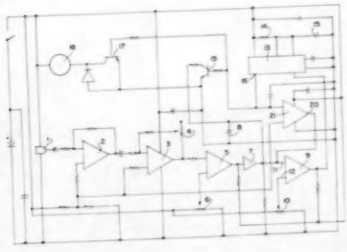
ELECTRONIC NOISE DETECTORS

Raymond L. Kirby, Alabaster, Ala., assignor to Buddy B. Simpson A/B Electronics, Woodland, Ala.

Filed Feb. 17, 1982, Ser. No. 349,622

Int. Cl.³ G08B *21/00*; G01H *9/00*

U.S. Cl. 73—646 **1 Claim**



1. An electronic noise detector device with a monitoring mode and a response mode, the device when in its monitoring mode having the ability to listen for noise, to detect noise, to distinguish between noise of different lengths of time with such being measured by the duration of the noise being monitored, and to respond to noises of different decibel levels and different lengths of duration by triggering a response mode of the device, and to do same on a continuous non-stop basis in a manner so that noises which exceed the predetermined decibel level but which are shorter in length than a predetermined time of diration will not trigger the response mode of the device; and

when in its response mode, after being triggered by the monitoring mode, having the ability to sound an audible alarm for varying lengths of time, while simultaneously interrupting the monitoring mode of the device to prevent said monitoring mode of the device from responding to the noise created by the audible alarm of said response mode, even though said alarm of the response mode does exceed the predetermined decibel level of unacceptability for an academic environment, and even though said alarm does exceed the predetermined length of time as measured by its duration, the interruption being such as to prevent the device from retriggering the response mode of the device and thereby prevent the device from going into an endless cycle of alarms, said device comprising:

(a) means for converting sound waves into a voltage potential signal,

(b) means for inverting and amplification of the signal at a fixed gain,

(c) means for inverting and amplification of the signal with an adjustable gain,

(d) means for setting the device to response to noise in the range of 40 db to 90 db,

(e) means for setting a threshold level which allows monitoring of a given sound level for a time period of up to five seconds without triggering the response mode,

(f) means for automatically interrupting the monitoring mode when the device is in a response mode, and

(g) means for automatically returning the device to a monitoring mode upon completon of the response mode.

4,416,156

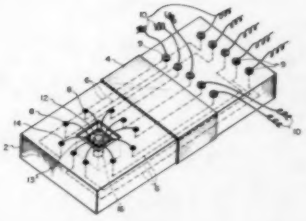
HIGH PRESSURE ELECTRICAL FEEDTHRU

Anthony M. Demark, Plymouth Meeting, and William K. Erhardt, Richboro, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 23, 1981, Ser. No. 333,842

Int. Cl.³ G01L *9/06*

U.S. Cl. 73—727 **10 Claims**



1. An electrical feedthru comprising

a plurality of electrical conductors,

an electrically insulating ceramic structure extending longitudinally along said conductors and being in fluid-tight relationship therewith,

a first plurality of electrical connectors mounted on a first end of said ceramic structure with each of said connectors being connected to a respective one of said electrical conductors at one end of said electrical conductors,

a second plurality of electrical connectors mounted on a second end of said ceramic structure with each of said second connectors being connected to respective ones of the other ends of said electrical conductors,

a surface area encircling said ceramic structure intermediate said first and second plurality of electrical connectors to provide a surface for connection to a surrounding housing as a fluid-tight seal therebetween,

an aperture in one end of said ceramic structure adjacent to a first one of said plurality of electrical connectors,

a sensor mounted within said aperture and

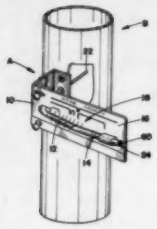
a plurality of electrical connectors connecting said sensor to said first plurality of electrical connectors.

4,416,157

INCLINED MANOMETER

Richard C. Cornelison, Hiram, Ohio, assignor to Condar Co., Hiram, Ohio

Filed Aug. 13, 1981, Ser. No. 292,503
Int. Cl.³ G01L 7/18
U.S. Cl. 73—747 11 Claims



1. A manometer for gauging the draft of a flue pipe comprising:

an opposed pair of inclined manometer legs, one of said legs having a first open-ended terminal end and a second of said legs having a second open-ended terminal end, each of said legs being inclined at a relatively large angle and being integrally joined at a midpoint nadir, said nadir including a recess; and,

a mounting plate for mounting said pair of legs, said plate including a gauge for identifying pressure differential between said first terminal end and said second terminal end and wherein said first terminal end is adapted to be received in said flue pipe and said second terminal end is opened to the environment of said flue pipe;

said mounting plate being attached to a mounting bracket and including means for selectively leveling said manometer legs;

said mounting bracket comprising a pair of opposed right angle brackets, said pair being fastened together, a first of said brackets including means for fastening said pair to said flue pipe and including an aperture for receiving a terminal end portion of said first manometer legs, said first open-ended terminal end being received in said flue pipe and a second of said brackets being fastened to said mounting plate.

4,416,158

PUNCHING-SHEARING METHOD FOR INSPECTING QUALITY OF BUTT WELDED JOINT

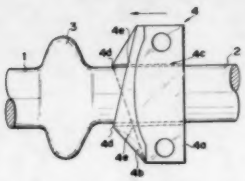
Tadashi Takimoto, Fuchu; Hirotsugu Oishibashi, Musashino; Katsuyoshi Ueyama, Musashino; Muneyuki Ohara, Musashino; Mitsuo Nakamura, Higashikurume, and Takayoshi Amano, Fussa, all of Japan, assignors to Japanese National Railways and Hakusan Seissaku-sho Co., Ltd., both of Tokyo, Japan

Filed Feb. 3, 1982, Ser. No. 345,531
Claims priority, application Japan, Jun. 18, 1981, 56-94327
Int. Cl.³ G01N 3/24
U.S. Cl. 73—842 2 Claims

1. A punching-shearing method for inspecting the quality of a butt welded joint, which comprises:

subjecting steel members to a pressure butt welding process under heat to form an annular bulge around a joint portion of the steel members,

subjecting the annular bulge to punching-shearing process under red heat immediately after the pressure butt welding process from one side of the annular bulge in parallel with the axes of the steel members by use of a shearing die having higher and lower shearing edge portions so that the higher shearing edge portions penetrate the annular bulge prior to the lower shearing edge portions, so as to cause the base of the bulge to remain around the joint portion in a slightly higher position than the peripheral surface of the steel members, and



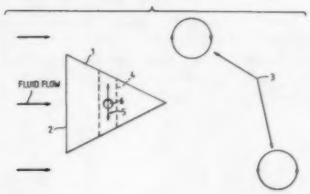
determining the quality of the joint portion of the steel members from the peripheral surface of the base of the bulge remaining on the peripheral surface of the joint portion of the steel members.

4,416,159

VORTEX FLOWMETER

Roger J. Williamson, Harlow, and David N. Batchelder, London, both of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 19, 1981, Ser. No. 312,494
Claims priority, application United Kingdom, Nov. 27, 1980, 8038032
Int. Cl.³ G01F 1/32
U.S. Cl. 73—861.22 1 Claim

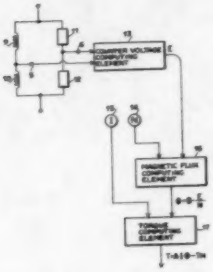


1. A vortex shedding flowmeter for measuring the velocity of flow of a fluid in a pipe, said flowmeter comprising: a bluff body located in the pipe so that fluid flow therein products vortices which are shed from the bluff body at a rate dependent on the velocity of the fluid flow, the vortices produced by the fluid flow being shed alternately from opposite edges of a surface of the bluff body which faces the direction from which the said fluid comes, first and second intersecting holes in said bluff body, said first hole extending into said bluff body from one of the surfaces thereof downstream of the first mentioned surface, said hole having an axis substantially at right angles to the direction of fluid flow, a light source, a light detector facing said light source at the ends of said second hole so that a light beam traverses said first hole in a direction at right angles to the axis of said first hole, said light beam being modulated in accordance with the frequency of the oscillations in said first hole, and measuring means responsive to the modulation of said light beam to give an output reading dependent upon the fluid flow rate, wherein said bluff body has as its cross section a scalene triangle with one flat face facing the oncoming fluid and set substantially normal thereto, wherein said first hole is a blind hole extending from another of its faces into the bluff body, and wherein a Fabry-Perot interferometer is located at the inner end of the blind hole, the output of the interferometer giving a signal whose value depends on the fluid flow rate.

4,416,160
APPARATUS FOR DETECTING TORQUE IN ELECTRIC DYNAMOMETER

Hiroshi Sugimoto, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 354,042
Claims priority, application Japan, Apr. 27, 1981, 56-62430
Int. Cl.³ G01L 3/22
U.S. Cl. 73—862.17 1 Claim



1. An apparatus for detecting torque in an electric dynamometer which comprises:
first and second resistors having the same ratio as resistance ratio R_a/R_i of an armature winding resistance R_a to an interpole winding resistance R_i of the DC machine, said first and second resistors being in series and inserted in parallel to the armature of said DC machine;
a counter-voltage computing element connected to a point for connecting said armature winding with said interpole winding and a point for connecting said first resistor with said second resistor, respectively, and by which a counter voltage E of said DC machine is computed from a potential difference V between said points in accordance with the following equation:

$$E = V \times \frac{R_a + R_i}{R_i} - V_B$$

where V_B is brush drop voltage;
a device for detecting speed of rotation of a rotor of said DC machine connected to said rotor and generating a signal in response to the speed of rotation of said rotor;
a magnetic flux computing element for transmitting an output signal by receiving an output signal from said device for detecting speed of rotation as well as an output signal from said counter-voltage computing element;
an armature current detector for detecting armature current of said DC machine; and
a torque computing element for obtaining torque by receiving an output signal from said magnetic flux computing element and an output signal from said armature current detector.

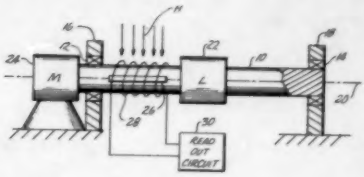
4,416,161
METHOD AND APPARATUS FOR MEASURING TORQUE

Sarkis Barkhoudarian, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 14, 1981, Ser. No. 301,683
Int. Cl.³ G01L 3/10
U.S. Cl. 73—862.36 34 Claims

1. A method for sensing the torque transmitted by a rotatable shaft from a prime mover to a load, the method comprising the steps of:
generating in the vicinity of the shaft a magnetic field;
forming on the shaft an elongated boundary between ferromagnetic regions having different coercivity, the boundary extending along the axis of the shaft and being differentially displaced by twisting of the shaft, the forming step forming the boundary in alignment with the axis of the shaft in the absence of torsional stress; and
detecting changes in magnetization in the regions during rotation of the shaft.

24. In a power transmission system, the combination comprising:
a shaft having a central axis;
means for supporting the shaft for rotation about its central axis;

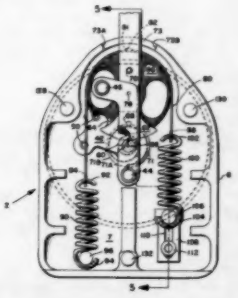


means for generating a magnetic field in the vicinity of the shaft;
means for forming on the shaft in the vicinity of the magnetic field an element in which a ferromagnetic material having low coercivity is surrounded by a ferromagnetic material having high coercivity so as to exhibit the avalanche-Barkhausen effect, said element being differentially displaced as a function of twisting displacement of said shaft; and
means for sensing the avalanche-Barkhausen effect in said element.

4,416,162
GRAM BEAM FORCE GAUGE

Alfred L. Lea, Doylestown, Pa., and Frank A. Votta, Jr., Clearwater, Fla., assignors to Ametek, Inc., New York, N.Y.

Filed Apr. 19, 1982, Ser. No. 369,350
Int. Cl.³ G01L 1/04
U.S. Cl. 73—862.62 4 Claims



1. A gram beam force gauge comprising:
a housing having a peripheral wall and a partition with a front face and a rear face substantially perpendicular to the peripheral wall,
a dial mounted on the front face of said partition,
a pointer overlying said dial and mounted on a rotatably mounted shaft passing through said partition,
a pinion mounted on the shaft to the rear of the partition,
a sector gear engaged by the pinion,
a drum carrying said sector gear and rotatably mounted

adjacent the rear face of the partition on an axis parallel to the axis of the pinion,

a flexible band passing around the drum for rotating the drum and having a pair of free ends,

a first extension coil spring having one end secured to the housing and the other end secured to one of the free ends of the band,

a second extension coil spring having an end connected to the other of said free ends of the band,

a slide connected to the other end of the second spring and adjustably secured to the partition for preloading said springs and zero adjusting the pointer, and

a force transmitting beam secured to the drum and extending through an opening in the peripheral wall and beyond the housing, the peripheral wall limiting the movemend of the beam.

4,416,163

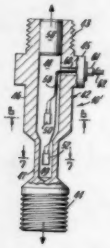
STRAIN GAGE LOAD CELL INSENSITIVE TO EXTERNAL PRESSURE

Alexander Yorgiadis, 1404 Garza St., Anaheim, Calif. 92804

Filed Jun. 3, 1981, Ser. No. 269,904

Int. Cl.³ G01L *1/22, 1/26*

U.S. Cl. 73—862.65 **7 Claims**



1. A strain gage load cell for the measurement of axial loads comprising a tubular member having a longitudinal opening therein and means for applying said axial load longitudinally thereof, at least two strain gages mounted on the inner surface of the wall defining said opening, means for connecting said gages to an indicator to sense axial strain applied to said member, and means for modifying the sensitivity of one of said gages relative to the other to cause said gages to react uniformly in response to circumferential strain and non-uniformly to said axial load.

4,416,164

PUSH-BUTTON TYPE TUNING APPARATUS

Teruo Shimazu, Atsugi, Japan, assignor to Mitsumi Electric Company, Ltd., Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 235,054

Claims priority, application Japan, Jun. 17, 1980, 55-84506

Int. Cl.³ H03J *5/12*; G05G *1/02*

U.S. Cl. 74—10.33 **8 Claims**

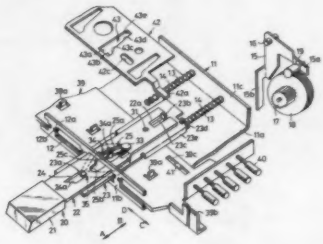
1. A push-button type tuning apparatus comprising: a frame;

a plurality of push-button assemblies each having a push-button on one end thereof, and inserted into and supported by said frame, said push-button assembly being slidable in the pushing direction between a non-operational position and an operational position;

a cam member provided on said frame, said cam member being slidable in a direction perpendicular to the pushing direction of said push-button assembly; and

a tuner provided on said frame, said tuner being tuned according to the sliding quantity of said cam member,

said push-button assembly further having a memory piece which has a V-shaped cam portion, said memory piece being rotatably supported in the vicinity of the open portion of said V-shaped cam portion in a state where the vertex of said V-shaped cam portion faces towards the direction of said push-button, and first locking means for locking said memory piece at a desired rotated position, p1 said cam member further having a projecting cam portion provided on the inner side of said V-shaped cam portion of said memory piece,



said V-shaped cam portion of said memory piece which is in the locked state, making contact with and pushing against said projecting cam portion of said cam member upon sliding of said push-button assembly in the operational position, and guiding said projecting cam portion to said vertex of said V-shaped cam portion to slide said cam member in the perpendicular direction with respect to the pushing direction of said push-button assembly.

4,416,165

STEPPING GEAR

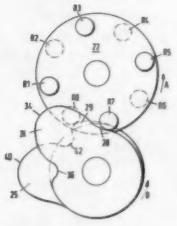
Klaus Kramer, Bad Bramstedt, and Rolf Huss, Hamburg, both of Fed. Rep. of Germany, assignors to Focke and Company, Verden, Fed. Rep. of Germany

Continuation of Ser. No. 116,417, Jan. 29, 1980, abandoned. This application Dec. 29, 1981, Ser. No. 350,927

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1979, 2903732

Int. Cl.³ F16H *25/16, 53/00*

U.S. Cl. 74—70 **7 Claims**

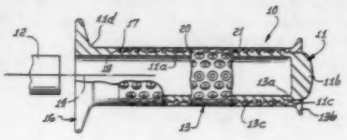


1. A stepping gear mechanism, comprising: an output member, at least one wheel connected to said output member, said wheel being provided with rollers alternatingly arranged on both sides thereof, driving means comprising two disc cams rotationally secured to an input, said disc cams being engaged with said rollers in form locking engagement at all times, said cam discs rotating in one direction and normally causing either no wheel rotation or wheel rotation in a first, forward direction, but wherein a first one of said disc cam includes means for causing reverse movement of said wheel comprising an undercut formed in a roller engaging surface thereof, the second of said disc cams including a zone of increased cam radius circumferentially offset from the location of said undercut.

4,416,166
HANDLE GRIP

James H. Jannard, Laguna Niguel, and George J. Tackles, San Jose, both of Calif., assignors to Oakley, Inc., Irvine, Calif.

Filed Mar. 30, 1982, Ser. No. 363,631
Int. Cl.³ B62K 21/26
U.S. Cl. 74—551.9 11 Claims



1. A two-part grip for a handle defined by a bicycle or motorcycle, or the like, comprising

(a) a one piece lengthwise elongated inner support sleeve adapted to fit on and grip the handle, and

(b) a one piece lengthwise elongated outer sleeve fitted over the inner sleeve and positioned to be comfortably grasped by the user, the outer sleeve having an outer surface and there being an exterior zone adjacent said outer sleeve,

(c) and protuberances integral with the inner sleeve and holes extending radially through the outer sleeve, the protuberances received in the holes,

(d) the protuberances spaced apart lengthwise of said sleeves and also spaced apart circumferentially of said sleeves, the protuberances having surfaces exposed to said exterior zone via said holes which are also spaced apart lengthwise and circumferentially of the sleeves,

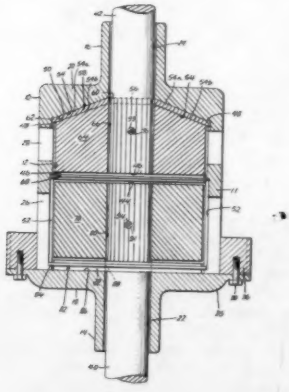
(e) the sleeves closely interfitting one another lengthwise between and circumferentially between said spaced protuberances,

(f) both sleeves being non-metallic and the said surfaces of the protuberances being inwardly of a cylinder defined by said outer surface of the outer sleeve.

4,416,167
CLUTCH DRIVE DIFFERENTIAL

Artis J. Stacy, 3008 Hoagland Ave., Fort Wayne, Ind. 46807

Filed Dec. 15, 1980, Ser. No. 216,377
Int. Cl.³ F16H 35/04
U.S. Cl. 74—650 9 Claims

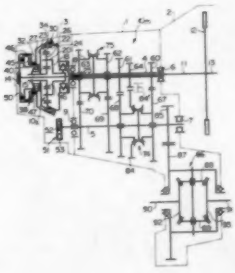


1. A clutch drive differential comprising a hollow drive casing having opposite ends provided with first and second coaxial shaft receiving bores, first and second coaxial shafts disposed in end-to-end relation rotatably received by said first and second bores, respectively, first and second drive wheels internally of said casing secured to but axially movable on said first and second shafts, respectively, for rotation therewith, said drive wheels being axially juxtaposed, a clutch plate keyed to said casing for axial movement and interposed between adjacent radial faces of said drive wheels and being operatively frictionally engageable therewith, cam means interposed between the opposite end face of said first drive wheel and the adjacent first inner end face of said casing for imparting rotation to said first drive wheel and axial movement of said first drive wheel into operative engagement with said second drive wheel in response to relative rotation between said casing and said first drive wheel, the opposite end face of said second wheel being operatively frictionally engageable with the adjacent second inner end face of said casing, whereby relative rotation between said casing and said first wheel moves the latter axially into operative engagement with said second wheel causing the second drive wheel to move axially into operative engagement with said second casing end face and thereby frictionally rotationally locking both drive wheels and casing together for rotation in unison.

4,416,168
TRANSMISSION AND SUB-TRANSMISSION WITH MUTUALLY CONTENDING HELICAL GEARS

Hajime Arai, Aichi, and Shoji Haga, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 7, 1980, Ser. No. 194,857
Claims priority, application Japan, Nov. 5, 1979, 54-143755
Int. Cl.³ F16H 3/06, 3/44
U.S. Cl. 74—740 5 Claims



1. A transmission for an automotive vehicle, comprising:

(a) a main transmission device comprising:

a main casing;

a rotatably supported power output shaft;

a tubular intermediate shaft rotatably supported parallel to the power output shaft; and

a plurality of helical gears on said shafts for transmitting rotational power between them;

the helical engagement of at least one pair of said helical gears, one of which is on said tubular intermediate shaft, exerting a first axial force on said tubular intermediate shaft when said pair of helical gears are transmitting rotational power with said tubular intermediate shaft rotating in a certain predetermined rotational direction;

(b) a power input shaft coaxial with the tubular intermediate shaft and passing through its central hole, with its one end protruding out of one end of said tubular intermediate shaft, and its other end protruding out of the other end of said tubular intermediate shaft and being driven; and

(c) a substransmission comprising:

a sub-casing;

a helical sun gear;

a carrier connected to said one end of the power input shaft;

a helical ring gear connected to said one end of the tubular intermediate shaft;

a plurality of helical pinions rotatably supported by the carrier and meshed between the sun gear and the ring gear; and

a frictional engagement means which selectively connects said sun gear to either said sub-casing or said ring gear, and which comprises a frictional engagement element rotationally connected with said sun gear, a spring which drives said frictional engagement element in a first axial direction opposite to the direction of said first axial force toward engagement with said ring gear and exerts a second axial force on said tubular intermediate shaft via said frictional engagement element and said ring gear when said frictional engagement means is connecting said sun gear to said ring gear, said second axial force opposing to said first axial force, and a fluid pressure actuator which, when actuated, drives said frictional engagement element in a second axial direction opposite to said first axial direction toward engagement with said sub-casing by overcoming said spring;

wherein the handedness of said ring gear and said pinions is so arranged that, when the power input shaft and the carrier are being driven in said certain rotational direction and are rotationally driving the ring gear and the tubular intermediate shaft via a planetary movement of the planetary pinions, in said certain rotational direction, the helical engagement of said planetary pinions and said ring gear exerts a third axial force on said tubular intermediate shaft via said ring gear wheich is opposed to said first axial force.

4,416,169

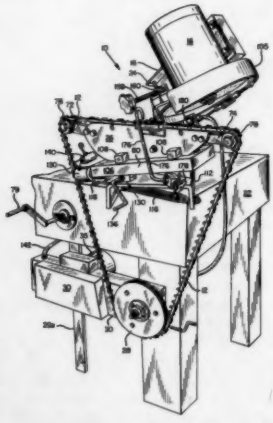
AUTOMATIC SAW CHAIN GRINDER

Elmer R. Silvey, 1231 Dutton Rd., Eagle Point, Oreg.

Filed Mar. 31, 1981, Ser. No. 249,744

Int. Cl.³ B23D *63/16*

U.S. Cl. 76—25 A **18 Claims**



1. An automatic saw chain grinder for grinding a selected surface of successive cutter links of a saw chain, comprising:

a rotatable grinding wheel,

mounting means mounting the grinding wheel for movement toward and away from a grinding position,

saw chain support means for mounting a saw chain for indexing movement therealong to position successive cutter links adjacent said grinding position,

first hydraulic pressure-operated means acting on said mounting means for controlling the movement of said grinding wheel toward and away from said grinding position,

indexing means including a power-operated reciprocating rod means acting on a chain wheel for moving said chain along said support means to index successive cutter links for sharpening,

and power-operated sequencing means operable to reciprocate said rod means and pressurize and depressurize said hydraulic pressure-operated means in sequence such that a first cutter link is indexed for grinding before said grinding wheel is moved to said grinding position and said grinding wheel is moved from said grinding position before a second cutter link is indexed for grinding,

carriage means mounting said saw chain support means for reciprocation to move a cutter link on said support means between said grinding position and a retracted position,

second hydraulic pressure-operated means acting on said carriage means for controlling said reciprocation,

common hydraulic conduit means for supplying pressure fluid from a common source to said first and second pressure-operated means,

and control means for controlling the operation of said first and second pressure-operated means in sequence upon operation of said sequencing means to pressurize and depressurize said common conduit means such that said grinding wheel moves to said grinding position before said support means moves an indexed cutter link to said grinding position and such that said support means moves said cutter link to said retracted position before said grinding wheel moves from said grinding position.

4,416,170

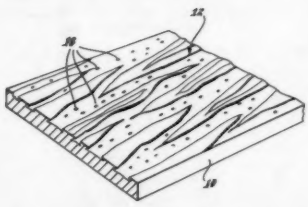
METHOD OF PRODUCING A STEEL CAUL

Donald B. Gibson, and Gerald F. Laughinghouse, both of Rock Hill, S.C., assignors to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 288,644, Jul. 30, 1981, abandoned, which is a division of Ser. No. 201,715, Oct. 29, 1980. This application Mar. 28, 1983, Ser. No. 479,106

Int. Cl.³ B21K *5/20*

U.S. Cl. 76—107 R **4 Claims**



1. A process for forming a steel caul to use in forming panel surfaces on panels made of reconstituted wood by pressing said cauls against said reconstituted wood at temperatures of up to about 475° F., said process comprising the steps of:

a. selecting one face of said caul to form said panel surfaces,

b. forming a decorative pattern on said selected face, said decorative pattern being adapted to be pressed against the reconstituted wood panels to form the panel surfaces on said panels, and

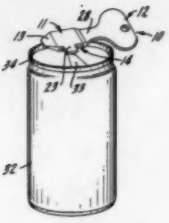
c. thereafter, roughening the decorative pattern formed on the selected face of said steel caul by sand blasting said face with number 12-35 sand thereby forming a multiplicity of indentations in said decorative pattern on said selected face said indentations being large enough to capture and retain the carbon materials produced by the use of said caul in forming said panel surfaces, but not being so large as to have a visibly noticeable detrimental effect on the said decorative pattern in said selected face.

4,416,171

TAB-TOP CAN OPENER

John F. Chmela, Mt. Prospect; Carl R. Fletcher, Arlington Heights, and Norton Sarnoff, Northbrook, all of Ill., assignors to Ensar Corporation, Wheeling, Ill.

Filed Dec. 21, 1981, Ser. No. 332,868
Int. Cl.³ B67B *7/40, 7/44*
U.S. Cl. 81—3.46 R **7 Claims**



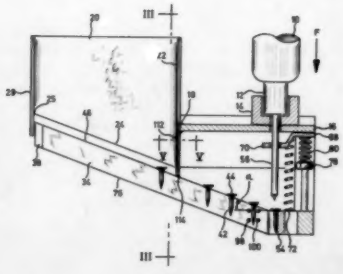
1. A tab-top can opener comprising a slotted body portion integrally formed with a handle at one end and chisel-like starter edge at an opposite end, said opener having a long axis extending in a direction from said handle end to said starter edge end, said body portion including a transverse tab slot extending therethrough with openings at upper and lower sides, the opening at the lower side being the opening for tab insertion, the body having spaced-apart first and second wall portions connecting at opposite side walls to define the depth and width of said slot, said tab slot being sized to accommodate a major portion of a can tab therein, at said lower side said first wall portion including a striker projection extending slot-outwardly a distance from said lower side, whereby said opener is capable of engaging a can tab within said slot transversely to said long axis, and said opener capable of opening a tab-top can by means of rotating the opener around said long axis, wherein during engagement of a tab in said tab slot the long axis is maintained in generally parallel relationship with the top of the can, wherein said opener is useful for prying open cans of both the removable and stay-on type tab-tops.

4,416,172

APPARATUS FOR AUTOMATICALLY FEEDING SCREWS TO A SCREWING MECHANISM

Walter Medinger, Waldrand 7, D-6730 Neustadt, Fed. Rep. of Germany

Filed May 14, 1981, Ser. No. 263,361
Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018382
Int. Cl.³ B25B *23/02*
U.S. Cl. 81—57.37 **11 Claims**



1. Apparatus for automatically feeding screws to a screwing mechanism which includes a rotary screw tool at a screw-in site, said apparatus coprising:

a container fixedly connected to said screwing mechanism, said container adapted to contain a supply of screws,

a feed channel communicating said container with said screw tool to guide screws from said container to a position aligned with a longitudinal axis of said tool,

said feed channel and tool being mounted to provide for relative movement therebetween in a generally up and down direction of said longitudinal axis to selectively engage and disengage said tool and an aligned screw, and

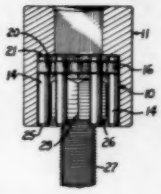
spring means arranged to act against said feed channel and screwing mechanism to urge said feed channel and screwing tool apart toward a screw-disengaging condition.

4,416,173

WRENCH ADAPTER

Edward J. Rebish, Euclid, Ohio, assignor to Russell, Burdsall & Ward Corporation, Cleveland, Ohio

Filed Dec. 7, 1981, Ser. No. 327,810
Int. Cl.³ B25B *13/58*
U.S. Cl. 81—185 **22 Claims**



1. A wrench adapter for wrenches having a regular polygonal wrenching opening therein which provides flats and corners at the intersection of adjacent flats, comprising a plurality of generally cylindrical rigid pins, and a retainer connecting said pins, said retainer positioning said pins in an array in which said pins are substantially parallel and are symmetrically positioned about a central axis, said adapter being insertable into and removable from such wrenching opening with said pins positioned in said corners thereof, said adapter permitting use of a wrench on fasteners having a size different from the size of the wrenching opening therein, said pins being operable to engage associated flats of such an opening and adjacent surfaces of such a fastener and upon such engagement being operable to transfer substantial torque applied to such wrench to such fastener.

4,416,174

AUXILIARY SUPPORT FIXTURE FOR A STEADY REST

Paul J. Owsen, Traverse City, Mich., assignor to Century Specialties, Inc., Traverse City, Mich.

Filed Jun. 24, 1981, Ser. No. 276,729
Int. Cl.³ B23B *3/36, 25/00*
U.S. Cl. 82—38 R **6 Claims**

1. An auxiliary support fixture for a steady rest having a plurality of movable fingers extending from one end thereof between opposing faceplates, operative to be moved by a pneumatically operated piston for engaging a workpiece to be machined by a tool, said fixture comprising:

a bracket mounted on one faceplate of the steady rest, said bracket including an arcuate slot therein which is concave with respect to the end of the steady rest;

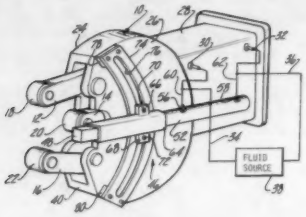
an elongated cylinder containing a pneumatically operated piston;

an abutment member connected to one end of the piston, said abutment member including a stationary end face for engaging a workpiece;

means for connecting said cylinder to the slot in the bracket

whereby the angle of the longitudinal axis of the cylinder may be adjusted; and

means for connecting said pistons of the steady rest and support fixture to a common fluid source so that said abutment member and steady rest fingers move in unison, with the abutment member being adapted to engage the workpiece diametrically opposite the machine tool to provide additional backup support for the workpiece during machining operations.



4,416,175

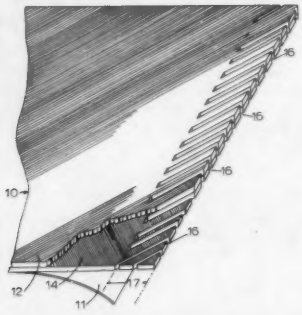
COMPOSITE LAMINATING METHOD AND PRODUCT

Timothy J. Bettner, Costa Mesa; Frank E. Sullivan, Redondo Beach, and Croydon R. Hartley, Fountain Valley, all of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Filed Feb. 1, 1982, Ser. No. 344,479

Int. Cl.³ B26D *7/06*; B32B *31/00, 5/12*

U.S. Cl. 83—29 **2 Claims**



1. A method of providing structural drop-off in a two-ply resin impregnated preplied laminate wherein each ply of said laminate has unidirectionally oriented fibers, with the fibers of each ply oriented across the fibers of the other ply on a bias, comprising the step of:

feather cutting a common edge of said two-ply resin impregnated preplied laminate so that said feather cuts are parallel to the orientation of the fibers in one said ply and across the orientation of the fibers in the other said ply whereby neglible structural effect is caused in said one ply and significant structural effect is caused in the other ply by shortening of the fibers along the feather cut edge.

4,416,176

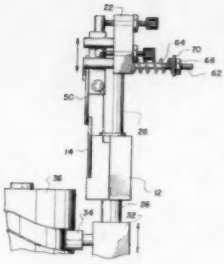
CUTTER ASSEMBLY FOR CUTTING STRIP MATERIAL

Frederick Forthmann, 688 Pascack Rd., Washington Township, Washington County, N.J. 07675

Filed Jan. 15, 1982, Ser. No. 339,761

Int. Cl.³ B26D *1/08*

U.S. Cl. 83—582 **6 Claims**



1. A cutter assembly for cutting strip material into individual lengths, comprising a fixed support, a fixed blade having a first side secured to said support and an opposite second side and having a top cutting edge over which the strip material to be cut is fed, a movable member movable upwardly and downwardly relative to said fixed blade, guideway means defined at laterally spaced locations on said movable member, means connected to said movable member to move it upwardly and downwardly, a movable blade assembly including a block portion and a blade portion, said block portion having a guide portion extending laterally outwardly from each end and confined in respective guideway means, said blade portion having a bottom knife edge cooperable with said top cutting edge of said fixed blade to sever the strip material, spring means acting between said movable blade assembly and said movable member to urge said movable blade toward said movable member, and a plurality of threaded adjustment members threaded to said movable member and acting on said movable blade assembly at laterally and vertically spaced locations to adjust the position of said movable blade assembly relative to said movable member and said fixed blade.

4,416,177

DATA INPUT FOR COMPUTER ORGAN

Marvin Loeb, 2120 Middlefield Rd., Palo Alto, Calif. 94301

Filed Mar. 2, 1981, Ser. No. 239,849

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.19 **2 Claims**

1. In combination a digital computer organ equipped with an optical card reader having a number of optical sensors in a pattern and operable for altering the contents of a number of voice patterns of the organ;

a keyboard with a plurality of keys, a first group of keys of the keyboard being specific to selected voice patterns of said computer organ, and a second group of keys of the keyboard being function keys for modification of a selected voice pattern, said keyboard being operative to generate a binary signal to indicate actuation of individual keys of the keyboard;

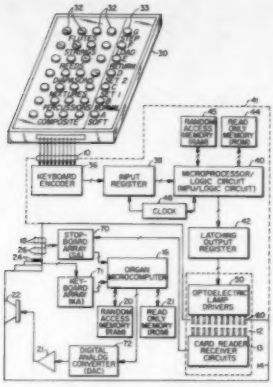
a decoder responsive to said binary signal for generating a unique digital word identifying a selected voice pattern;

a storage register for temporarily storing said digital word from said decoder;

a circuit means responsive to said stored word in said storage register for generating a plurality of digital bytes in a preselected sequence;

a number of optoelectrical emitters adjacent to and arranged in an array matching the pattern of said optical sensors of

said optical card reader of said digital computer organ; and a number of drivers coupled to said optoelectrical emitters and responsive to said sequence of bytes for driving corresponding optoelectrical emitters such that



signals applied to said emitters are recognizable at corresponding optical sensors of the organ as a programming pattern for alterable voice patterns of said digital computer organ.

4,416,178

TOUCH RESPONSE PROVIDING APPARATUS

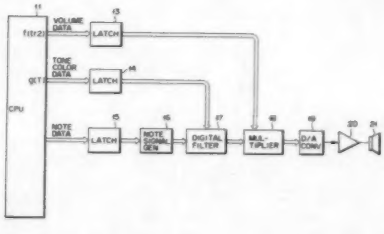
Hideaki Ishida, Hachioji, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1981, Ser. No. 330,843

Claims priority, application Japan, Dec. 22, 1980, 55-182230; Dec. 22, 1980, 55-182231

Int. Cl.³ G10H *1/06, 1/34, 1/46*

U.S. Cl. 84—1.19 **16 Claims**



1. A touch response providing apparatus for changing the characteristics of output musical sound from an electronic keyboard musical instrument, having a plurality of performance keys, according to the state of operation of a performance key being operated, comprising:

a set of at least three switches coupled to each of said performance keys of the electronic keyboard musical instrument and which are switched in a predetermined order at the time of the operation of said each key;

counting means coupled to said set of at least three switches for each of said keys for counting the periods required for the switching of the individual switches corresponding to an operated key at the time of the key operation, and for providing a count output corresponding to the length of the counted periods; and

control means coupled to said counting means for controlling at least two characteristics of the output musical sound produced by the instrument in correspondence with the key operation as a function of the count output of said counting means.

4,416,179

ELECTRONIC MUSICAL INSTRUMENT

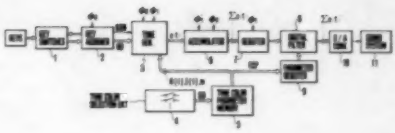
Masutada Wachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1982, Ser. No. 370,177

Claims priority, application Japan, Apr. 23, 1981, 56-60609

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.19 **11 Claims**



1. An electronic musical instrument comprising:

keyboard means having a plurality of keys;

tone color selecting means for selecting a tone color among predetermined tone colors;

tone signal generating means for generating, on a time division basis, musical tone signals corresponding to depressed keys among said plurality of keys, said musical tone signals collectively forming a periodic sequence of sampled values which occurs respectively, each said musical tone signal containing a fundamental component and harmonic components determined by the selected tone color;

accumulating means connected to said tone signal generating means for accumulating the sampled values of said sequence and resetting the accumulated value to a predetermined value after outputting an accumulated musical tone signal represented by said accumulated value once per repetition of said sequence;

digital filtering means connected to said accumulating means for imparting a fixed formant characteristic characterizing said selected tone color to said accumulated musical tone signal; and

musical tone forming means for forming a musical tone in accordance with said accumulated musical tone signal.

4,416,180

WAVE SYNTHESIZING APPARATUS

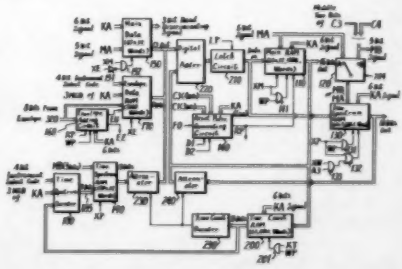
Hiroshi Ichigaya, Saitamo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 180,457, Aug. 22, 1980, abandoned. This application Sep. 17, 1982, Ser. No. 419,524

Claims priority, application Japan, Aug. 24, 1979, 54-107823

Int. Cl.³ G10H *1/06*

U.S. Cl. 84—1.23 **27 Claims**



1. A waveform synthesizing apparatus comprising:

means for digitally storing a selected plurality of identifiers

of previously selected harmonic and non-harmonic component waveforms of a selected analog output signal to be synthesized, some of said harmonic and non-harmonic identifier being stored in said means for digitally storing plural times corresponding to a selected rate at which an amplitude value for said corresponding component waveform is to be formed,

means for digitally generating a plurality of addresses, one at a time in sequence, said means for generating is connected to said means for digitally storing and adapted to repetitively generate said plurality of addresses and to cause said means for digitally storing to read out at a predetermined rate, for a predetermined time interval and in a predetermined sequence each of the members of said plurality of identifiers of components,

means for digitally sensing each said readout component identifier during a corresponding time interval and including means for calculating a corresponding amplitude value for each said respective harmonic and non-harmonic waveform component during said corresponding time interval, each said amplitude value is calculated at the rate corresponding to said number of times said corresponding component identifier is stored in said means for storing.

means for digitally combining during said corresponding time interval each said calculated amplitude value with a plurality of previously calculated and combined component amplitude values to form a digital value and

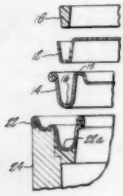
means for simultaneously forming during said corresponding time interval an analog output signal based on said corresponding digital value.

4,416,181

PRETUNED HEAD FOR DRUM OR THE LIKE

Donald R. Hartry, La Canada, and Remo D. Belli, Sherman Oaks, both of Calif., assignors to Remo, Inc., North Hollywood, Calif.

Filed Apr. 3, 1981, Ser. No. 250,912
Int. Cl.³ G10D *1/10, 13/02*
U.S. Cl. 84—272 **3 Claims**



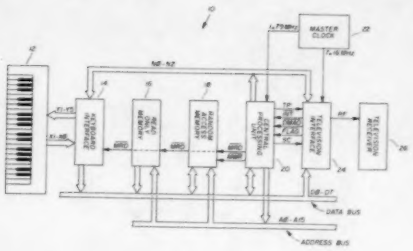
1. For use with the shell of a drum, tambourine, banjo or similar musical instrument, the improvement comprising, in combination: a hoop member having an inner rim and an outer rim defining an annular channel therebetween, a polymeric vibratile sheet stretched flat under tension across said inner rim of the hoop member and in contact therewith, said vibratile sheet having a peripheral portion secured in said channel, an annular plug received in said hoop member between said inner and outer rims, the tension forces in said vibratile sheet acting to produce a tone of the desired pitch when the sheet is caused to vibrate prior to installation on the shell, said vibratile sheet remaining out of contact with said shell after such installation.

4,416,182

KEYBOARD INSTRUMENT TEACHING DEVICE

Stephen A. Wise, Macungie, and John T. Whitefield, Harleysville, both of Pa., assignors to Allen Organ Company, Macungie, Pa.

Filed Sep. 24, 1981, Ser. No. 305,051
Int. Cl.³ G09B *15/00*; A63F *9/22*; G06F *15/44*
U.S. Cl. 84—470 R **8 Claims**



1. Apparatus for self instruction of a student of keyboard musical instruments which enables the student to correlate the positions of the keys on a musical instrument keyboard with the positions of the notes on a musical scale comprising:

a keyboard having a plurality of keys corresponding to the notes of a musical scale for generating a first set of control signals in an initialization or set up mode and for generating key-note correlation signals in an instruction or game mode;

at least one storage means having a predetermined combination of logical signals contained therein said predetermined combination of logical signals providing a source for a random sequence of one or more notes over a predetermined range in the game mode, said at least one storage means generating a second set of control signals in response to the actuation of one or more of said keys in either the set up or game modes;

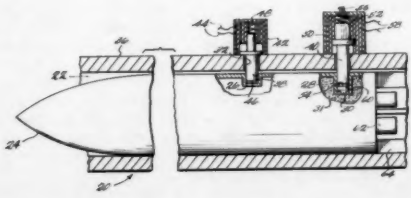
means for generating audio tones and displaying video images in accordance with said first and second sets of control signals on a video display means having an audio tone generating means associated therewith enabling the student to respond to the visually displayed images and audio tones by his or her selection of one or more of said keys and to visually and audibly check the accuracy of such selection.

4,416,183

ROCKET RETENTION AND IGNITION SYSTEM

Robert W. Adams, 11404 Farmland Dr., Rockville, Md. 20852, and Charles R. Donohoe, 15309 Basswood Ct., Rockville, Md. 20853

Filed Jul. 28, 1981, Ser. No. 287,643
Int. Cl.³ F41F *3/06*
U.S. Cl. 89—1.807 **27 Claims**



1. A rocket retention and ignition system comprising:

at least one rocket launch tube having a launching cavity therein for receiving a rocket to be launched and having a bore through a wall thereof for accommodating a retaining and firing pin;

a single rocket retaining and firing pin positioned so as to be linearly movable through said bore between a withdrawn position and an extended position wherein the pin extends into said launching cavity and shaped at a retaining end thereof for engaging, when extended, a retaining groove formed in a rocket received within said launching cavity, and having a firing contact for electrically engaging a firing contact of said rocket, the outside diameter of said retaining pin being of substantially the same size as the diameter of said bore in which it is received, but sufficiently smaller in diameter than said bore to allow for the linear displacement of said pin within said bore;

means for moving said pin to either its extended position for engaging the retainer groove of the rocket or to its withdrawn position for disengaging a rocket being launched or for permitting the loading or a rocket into the launch tube; and

means for conducting a rocket firing signal to said firing contact of said pin to fire said rocket.

4,416,184

AMMUNITION CHANNEL

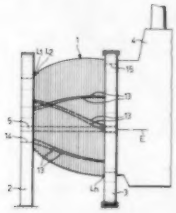
Erich Jenny, Schwerzenbach, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed May 21, 1981, Ser. No. 266,087

Claims priority, application Switzerland, Jun. 4, 1980, 4319/80

Int. Cl.³ F41D *10/04*

U.S. Cl. 89—33 BB **3 Claims**



1. An ammunition channel for the infeed of ammunition to a weapon which is pivotable about an elevation axis, comprising:

two end portions;

one of said end portions being mounted to be pivotable conjointly with the weapon;

a plurality of substantially planar plate-shaped elements pivotably arranged between both of said end portions;

tension and torsion resilient elements guided through said plate-shaped elements and attached to said end portions;

a shaft arranged substantially coaxially with respect to the elevation axis of the weapon;

said shaft being rotatably mounted in both of said end portions;

said plate-shaped elements being pivotably mounted upon said shaft; and

said tension and torsion resilient elements being arranged at essentially the same radial spacing from the shaft and directly extending through said plate-shaped elements.

4,416,185

ALTERNATE AMMUNITION BELT FEEDER OF AN AUTOMATIC FIRE ARM HAVING A LINEAR BREECH

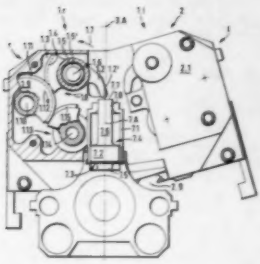
Norbert Schenk, Düsseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 24, 1981, Ser. No. 276,828

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 3023957

Int. Cl.³ F41D *10/32*

U.S. Cl. 89—33 SF **9 Claims**



1. An improved alternate ammunition belt feeder for an automatic fire arm having a linear breech, in particular a machine cannon, for selectively feeding ammunition from two separate ammunition belts arranged above the belt feeder via respectively a first and second cartridge feeding means, said first and second feeding means including two rotatable mirror-symmetrically arranged cartridge feeding stars mounted on respective support shafts therefor and a gas-pressure actuated energy converter including a piston-cylinder arrangement which is adapted to selectively provide driving energy received from the propellant gas which forms during firing to one of the two cartridge feeding stars and further having a housing which is laterally movable relative to the longitudinal axis of the weapon between a first and second end position through an intermediate position so that when said housing is selectively switched into one of the two end positions a ready to be fired cartridge from the first or second guide means is directly positioned into a position for entrainment by the breech of the weapon by the coaction of an energy receiving means which is operatively connected to the energy converter which is adapted to coact with said first (second) feeding means, the improvement comprising,

(a) said support shafts of the cartridge feeding stars are operatively mounted in said housing which is pivotally mounted in said belt feeder about an axis which is spaced from and parallel to the longitudinal axis of the weapon, so that said housing can be swung from one end position to the other end position via said intermediate position;

(b) said energy receiving means having a first actuating member which is adapted to coact with the piston of said piston-cylinder arrangement;

(c) said energy receiving means having a second actuating member which is operatively connected via form-locking driving means with the respective support shafts of the cartridge feeding stars;

(d) switching and control means are adapted to be operatively connected to the respective support shaft of the cartridge feeding star to introduce the required rotary and axial movement thereto for loading and unloading;

(e) the housing has a cartridge expelling slit for each cartridge feeding means;

(f) the cartridge expelling slits are separated from each other by a bisecting foot portion;

(g) when said housing is in the intermediate position there is no form-locking engagement between the piston and the energy receiving means, said foot portion having a U-

profile so that the breech of the weapon can reciprocate along its operative path without engaging any parts of said ammunition belt feeder; and

(h) said housing having a belt inlet opening adjacent to and to the left or right of said swing axis;

4,416,186

SEAR BUFFER

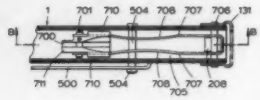
Leroy J. Sullivan, Singapore, Singapore, assignor to Chartered Industries of Singapore Private Limited, Jurong Town, Singapore

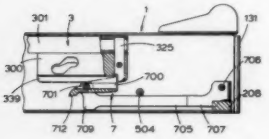
Filed Jul. 6, 1981, Ser. No. 280,740

Claims priority, application United Kingdom, Dec. 11, 1980, 8039739

Int. Cl.³ F41D *11/02*

U.S. Cl. 89—198 **8 Claims**





1. A sear buffer for a gas operated gun including a U-shaped member having resilient bowed longitudinal arms, each of said arms having a free end for mounting a sear therebetween and locating means for securing said U-shaped member to the gun.

4,416,187

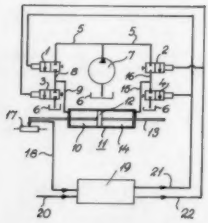
ON-OFF VALVE FLUID GOVERNED SERVOSYSTEM

Nyström Per H. G., Grahallavägen 10, SE-490 30 Borensberg, Sweden

Filed Feb. 10, 1981, Ser. No. 233,130

Int. Cl.³ F15B *13/044, 13/16*

U.S. Cl. 91—361 **1 Claim**



1. A servosystem comprising in combination, a fluid-actuated double-acting piston-cylinder unit, two on-off electrically controlled valves for governing supply of fluid to said unit arranged between a high pressure source and a low pressure reservoir for said fluid, two conduits for supplying fluid form said source to the opposing sides of said piston each having a branch connection being branched off from a fluid connection between the said high pressure source and one of said valves, common controller means coupled for operating the valves with two separate alternating trains of electrical pulses of variable width synchronously emitted therefrom, fluid control means connected between each of the said conduits and the source for supplying fluid to said piston from the source, means governing the opening and closing of each of said valves by said two separate output pulse signal trains emitted from said common controller in a manner respectively tending to move said piston in opposite directions to a servo position established in response to difference in pulse width in the two said pulse trains, and means for influencing the controller output pulse trains to establish said servo position in response to a comparison of the position of the piston with a governing signal, wherein said fluid control means consist of on-off valves governed by said pulse trains and are coupled upstream between said conduits and the high pressure source, and wherein one valve upstream to the branch connection of one conduit to the said piston and the valve downstream to the branch connection of the other conduit to the said piston are connected to a first of said pulse trains for synchronous governing, and that the two remaining valves are connected to the second of said pulse trains.

4,416,188

BRAKE BOOSTER

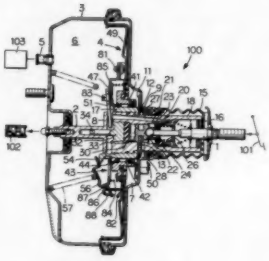
Masayoshi Katagiri; Takashi Fujii, both of Toyota, and Osamu Ogura, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan

Filed May 19, 1981, Ser. No. 265,224

Claims priority, application Japan, May 26, 1980, 55-72379[U]; May 27, 1980, 55-72859[U]

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—369 B **10 Claims**



1. A brake booster comprising:

an input member;

an output member;

a power piston disposed in a booster casing in such a manner as to divide an interior of said casing into two chambers so that said power piston may be actuated by a pressure difference in said two chambers, said power piston having a central bore;

a control piston coupled for axial movement within the central bore of said power piston and having a control valve means for controlling said pressure difference and a first transmission means coupled for transmitting an operational force received by said input member to said output member;

a reaction lever having a first input portion, and a second input portion, said reaction lever having a central output portion and being coupled to abut said output member at said central output portion, said reaction lever being coupled to receive an output force from said power piston at said first input portion and an output force of said first transmission means at said second input portion wherein said first and second input portions are located on opposite sides of said central output portion, for producing a larger stroke at said output member than the stroke at said input member;

a second transmission means coupled for axial movement

relative to said power piston and control piston, said power piston having an internal surface and said control piston having an external surface spaced from the internal surface of said power piston, said second transmission means being disposed in said space for transmitting said output force of said power piston to said first input portion of said reaction lever;

stopper means for limiting the relative movement of said second transmission means with respect to said power piston;

biasing means for biasing said second transmission means against said stopper means with a predetermined resilient force; and

said second transmission means being constructed and arranged such that it couples said power piston and said control piston in relatively fixed relationship with respect to one another when the reactionary force from said reaction lever exceeds said predetermined resilient force in response to movement of said power piston.

4,416,189

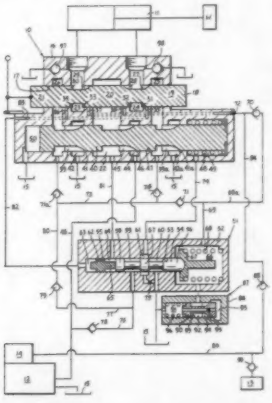
FULLY COMPENSATED FLUID CONTROL VALVE

Tadeusz Budzich, Moreland Hills, Ohio, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 21, 1982, Ser. No. 390,477

Int. Cl.³ F15B *13/02*

U.S. Cl. 91—421 **23 Claims**



19. A valve assembly comprising a housing having an inlet chamber connected to a pump, first and second load chambers connected to a fluid motor, and first and second outlet chambers connected to exhaust means, means operable to selectively communicate said first and second load chambers with said inlet chamber and said first and second outlet chambers, first control orifice means interposed between said inlet chamber and said first and second load chambers, second control orifice means interposed between said first load chamber and said first outlet chamber, third control orifice means interposed between said second load chamber and said second outlet chambers, first negative load fluid throttling means between said first outlet chamber and said exhaust means, second negative load fluid throttling means between said second outlet chamber and said exhaust means, connecting means between said first and said second negative load fluid throttling means, and control means operable to throttle fluid flow by said first negative load fluid throttling means to maintain a relatively constant pressure differential across said second control orifice means when said first load chamber is subjected to negative load and to throttle fluid flow by said second negative load fluid throttling means to maintain a relatively constant pressure differential across said third control orifice means when said second load chamber is subjected to negative load.

4,416,190

SEAL FOR COMPRESSOR

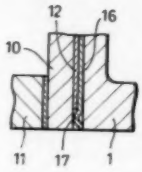
Yutaka Ishizuka, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1980, Ser. No. 214,097

Claims priority, application Japan, Dec. 13, 1979, 54-172526[U]; Jan. 31, 1980, 55-11033[U]

Int. Cl.³ F04B *1/16, 1/18*

U.S. Cl. 92—71 **21 Claims**



1. A compressor comprising:

a cylinder block;

a cylinder head rigidly mounted on one end of said cylinder block;

a valve plate interposed between said cylinder block and said cylinder head;

a sheet-like suction valve interposed between said cylinder block and said valve plate and having an outer peripheral edge; and

a gasket having elasticity and provided at least between said cylinder block and said cylinder head; said gasket having a radially inner flat portion, a radially outer flat portion and an axially projected swell located between said radially inner and said radially outer flat portions; said radially inner flat portion, said radially outer flat portion and said axially projected swell being formed integrally on said gasket; said axially projected swell being located in the vicinity of an outer peripheral edge of said gasket and extending along the whole circumference of said gasket; said axially projected swell being located radially outwardly of the outer peripheral edge of said sheet-like suction valve; said radially inner flat portion, said radially outer flat portion and said axially projected swell being wholly fixedly interposed between said cylinder block and at least one of said cylinder head and said valve plate and being elastically held within a clearance therebetween to seal at least the junction between said cylinder block and said cylinder head; said axially projected swell having, in a free state, a predetermined axial size which is larger than the sum of the thicknesses of said suction valve and other portions of said gasket, both in a free state; said clearance having a width thereof substantially determined by the sum of the thicknesses of said other portions of said gasket and said suction valve; and said axially projected swell being disposed within said clearance in a manner maintaining a swelled state thereof.

4,416,191

VACUUM BOOSTER DEVICE

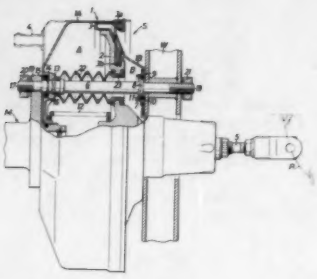
Hiroo Takeuchi, Asashina; Nobuaki Hachiro, and Yoshihisa Miyazaki, both of Ueda, all of Japan, assignors to Nissin Kogyo Kabushiki Kaisha, Nagano, Japan

Filed May 7, 1981, Ser. No. 261,149

Claims priority, application Japan, Sep. 19, 1980, 55-133437[U]

Int. Cl.³ F16J *15/18*

U.S. Cl. 92—165 PR **6 Claims**



1. In a vacuum booster device comprising a booster shell divided into a front bowl and a rear bowl, a booster piston accommodated in said booster shell, and tie rods extending through said booster piston for connection of said front and rear bowls, the improvement comprising a mounting support fixedly secured to an inside surface of the rear wall of said rear bowl, a stepped flange integrally formed around the outer periphery of said tie rods and fitted in said mounting support, said stepped flange having a large flange portion and a small flange portion, an annular recess defined by said stepped flange, said mounting support and said rear wall of said rear bowl, an elastic sealing member disposed in said annular recess, a retainer ring mounted in said mounting support and cooperating wih said sealing member for firmly holding in place said large flange portion of said stepped flange.

4,416,192

MULTI-DIRECTIONAL NOZZLE ASSEMBLY FOR A FLUID DISPENSING DUCT SYSTEM

Masao Izumi, Fujisawa, and Hiroshi Yoshida, Zama, both of Japan, assignors to Nissan Motor, Company, Limited, Kanagawa, Japan

Filed Nov. 24, 1981, Ser. No. 324,429

Claims priority, application Japan, Nov. 26, 1980, 55/165287

Int. Cl.³ F24F *13/062*

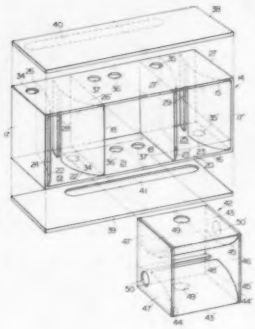
U.S. Cl. 98—40 N **2 Claims**

1. A multi-directional nozzle assembly for a fluid dispensing duct system, comprising:

a housing structure having first, second and third directions perpendicular to one another and at least three sections arranged in the first direction of the housing structure and consisting of first and second sections respectively constituted by the outermost two of the three sections and a third section constituted by the remaining one of the three sections, each of the first and second sections being arranged with a fluid dispensing passageway extending in a direction parallel with the second direction of the housing structure and first and second control fluid chambers spaced apart from each other across the fluid dispensing passageway in a direction parallel with the first direction of the housing structure, the housing structure further having in each of the first and second sections a pair of slots providing communication between the fluid chambers, respectively, of each of the first and second sections in directions parallel with said first direction of the housing structure, a fluid inlet opening for allowing the first control fluid chamber to be open at the fluid inlet end of each of the first and second sections, a first fluid distribution passageway between the first control fluid chamber of the first section and the second control fluid chamber of the second section, a second fluid distribution passageway providing communication between the first control fluid chamber of the second section and the second control fluid chamber of the first section, a first pair of openings each for providing communication between said first fluid distribution passageway and said third section and a second pair of openings each for providing communication between said second fluid distribution passageway and said third section so that a flow of fluid to be discharged from the fluid dispensing passageway is to be deflected by the slots of the housing structure in a plane parallel with the first and second directions of the housing structure,

two control valve units each provided in conjunction with one of the control fluid chambers of each of the first and second sections and operative to regulate the direction in which a flow of fluid to be passed through the fluid dispensing passageway of each of the first and second sections is to be discharged therefrom, and

a nozzle unit detachably fitted in the third section of the



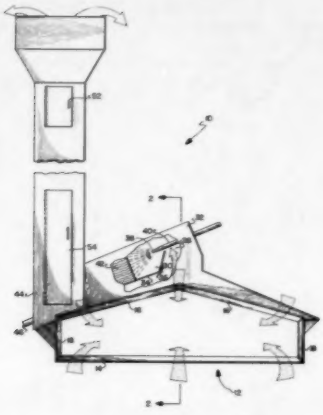
housing structure and having a fluid dispensing passageway extending in a direction parallel with the second direction of the housing structure, a pair of control fluid chambers spaced apart from each other across the fluid dispensing passageway of the nozzle unit and a pair of slots providing communication between the fluid dispensing passageway and the control fluid chambers of the nozzle unit in directions parallel with one of the first and third directions of the housing structure, a first pair of openings each for providing communication between said first fluid distribution passageway and one of the control fluid chambers of the nozzle unit, and a second pair of openings each for providing communication between said second fluid distribution passageway and the other of the control fluid chambers of the nozzle unit, the nozzle unit being assumable in the third section a first position in which a flow of fluid to be passed through the fluid dispensing passageway of the nozzle unit is to be deflected by the solts of said nozzle unit in a plane parallel with the second and third directions of the housing structure and a second position in which a flow of fluid to be passed through the fluid dispensing passageway of the nozzle unit is to be deflected in a plane parallel with the first and second directions of the housing structure.

4,416,193

SYSTEM FOR VAPOR PRECIPITATION AND RECOVERY IN A CONTINUOUS COATER

John Sharpless, Oberlin, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Feb. 5, 1982, Ser. No. 346,014
Int. Cl.³ B05D *1/02*; B01D *47/06*
U.S. Cl. 98—115 SB **18 Claims**



1. In a continuous coater having entrance and exit passages and a spray booth, at least one of the passages communicating with said spray booth, the improvement of a vapor precipitation and recovery system, comprising:

a scrubbing chamber located above said at least one passage;

a slot opening, said opening located substantially across the entire width of the top of said at least one passage so that said at least one passage communicates with said scrubbing chamber;

said scrubbing chamber having a spray nozzle means for providing a spray;

a precipitant baffle maintained within said scrubbing chamber and in close juxtapositional relationship to said spray nozzle means so as to be sprayed thereby;

said scrubbing chamber having a shield plate located between said spray nozzle means and said slot opening;

an exhaust stack, said exhaust stack located adjacent to said scrubbing chamber and being in communication therewith.

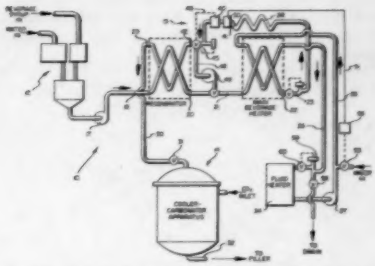
4,416,194

BEVERAGE PASTEURIZING SYSTEM

David M. Kemp, Naperville, Ill., assignor to FMC Corporation, Chicago, Ill.

Filed Dec. 3, 1981, Ser. No. 327,238
Int. Cl.³ A23L *3/00*
U.S. Cl. 99—275 **15 Claims**

1. A pasteurizing system, comprising, in combination: a heat recovery regenerator for receiving an incoming flow of beverage liquid and for transferring heat from an outgoing flow of beverage liquid to the incoming beverage liquid flow, a main beverage heater connected to the regenerator for heating the incoming beverage liquid flow to a pasteurizing temperature, a transfer line for leading the beverage from the regenerator to the main heater, a fluid heater for providing hot fluid to the main heater and thereby heat the beverage flow, a holding tube for holding the hot beverage until the pasteurizing process is complete and for transferring the hot beverage to the heat recovery regenerator, where the beverage looses heat to more incoming beverage, a low beverage temperature sensor in the holding tube for sensing excessively low beverage temperature, a diversion valve located in the holding tube downstream of the low temperature sensor but upstream of the heat recovery regenerator, and operated by the low temperature sensor, and a diversion line leading from the diversion valve to the



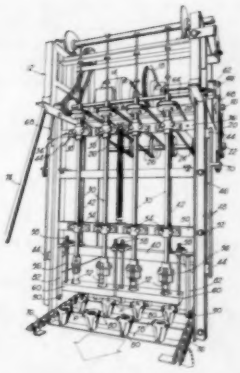
transfer line, whereby excessively cool beverage fluid in the holding tube is quickly recycled through the main heater for further heating and pasteurization.

4,416,195

PIMENTO CORING MACHINE

William T. Miller, Haddock, Ga., assignor to Cherokee Products Company, Haddock, Ga.

Filed Jan. 17, 1983, Ser. No. 458,483
Int. Cl.³ A23N *4/00, 4/12, 7/08*
U.S. Cl. 99—544 **12 Claims**



1. In a machine for coring pimentos and the like, a conveyor transporting pimentos to and from a coring position and dwelling at the coring position, a reciprocating coring knife carriage at the coring position and moving at substantially right angles to the path of movement of the conveyor toward and away from the conveyor whereby coring knives on said carriage can remove cores from pimentos and the like on the conveyor while the conveyor is dwelling and the carriage is substantially at its nearest proximity to the conveyor, the movements of the conveyor and carriage being synchronized but also being subject to non-synchronization at certain times, the improvement comprising mechanical means on the carriage and reciprocating with the carriage and entering an open space of the conveyor without contacting the conveyor when the carriage is at said nearest proximity to the conveyor and the conveyor and carriage are in proper synchronization, and the mechanical means engaging a mechanical part of the conveyor and thereby arresting movement of the carriage toward the conveyor substantially short of the nearest proximity of the carriage to the conveyor to prevent engagement of the coring knives of the

carriage with product holding cups of the conveyor when the conveyor and carriage are out of synchronization.

4,416,196

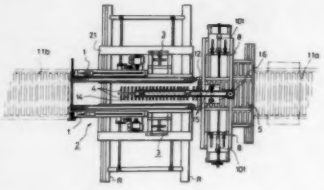
TYING MACHINE

Masatoshi Yamada, and Takaji Fuse, both of Funabashi, Japan, assignors to Yamada Kikai Kogyo Kabushiki Kaisha, Chiba, Japan

Continuation-in-part of Ser. No. 244,977, Mar. 18, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 426,952

Int. Cl.³ B65B *13/20*

U.S. Cl. 100—7 **16 Claims**



1. A tying machine comprising a bundle shaping unit including side aligning means for aligning sides of a bundle to be tied, a tying unit including a pair of tying devices disposed opposite to each other for tying a string around the bundle and press means exercising a compressing force upon the bundle to be tied during the tying operation effected by said tying devices, a feeding device for stopping the bundle during the operation of said bundle shaping unit and feeding the bundle from said bundle shaping unit to said tying unit one by one upon completion of each cycle of the operation of said bundle shaping unit, said feeding device including a conveyer portion associated with said tying unit and defining a predetermined linear path of travel of a bundle between said pair of tying devices, and means for moving said pair of tying devices transversely relative to said predetermined linear path of travel selectively away from or toward each other whereby different tying positions for bundles to be tied can be established.

4,416,197

WASTE MATERIAL COMPACTOR APPARATUS

Charles W. Kehl, 11466 Irvington, Warren, Mich. 48093

Filed Oct. 14, 1981, Ser. No. 311,346

Int. Cl.³ B30B *15/06*

U.S. Cl. 100—214 **21 Claims**

1. A cover for a waste receptacle having an open top end comprising:

a lip member adapted to engage the top end of the receptacle, the lip member having a central aperture;

a cover member having a shape proximate the shape of the central aperture for removably closing the central aperture in the lip member and adapted to be inserted through the central aperture into the waste receptacle for compacting the contents thereof; and

flanges formed on the lip member adjacent to and extending inward from the edges of the central aperture, the flanges supporting the cover member thereon to close the central aperture in the lip member.

4,416,198

DRIVE FOR PRODUCING MOTION WITH DWELLS

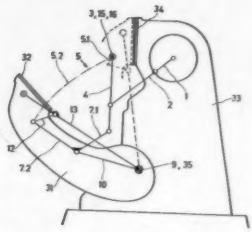
Otto Rasenberger, Emmendingen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 370,622

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, 3116172

Int. Cl.³ B41F *1/07;* **F16H** *21/32*

U.S. Cl. 101—3 R **11 Claims**



1. Drive for producing motion with intervening dwells comprising a four-bar linkage defining a couple curve travel path traversible only in part and having equally coincident forward and return paths, and a dwell-producing driven rocker arm pair connected thereto, the couple curve travel path having a vertex therein dividing said couple curve travel path into a short curve path for producing a dwell and an elongated curve path extending at an angle to the short curve path for producing a movement, said vertex of said couple curve being identical with an instantaneous pole defining the start and end of the dwell.

4,416,199

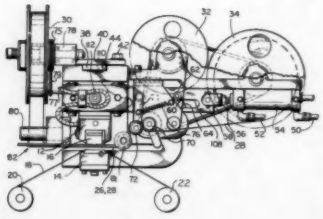
MULTICOLOR IMPRINTER

Charles F. Davison, Brookfield, Ill., assignor to Norwood Marking & Equipment Co., Inc., Downers Grove, Ill.

Filed Sep. 1, 1982, Ser. No. 413,705

Int. Cl.³ B41J *35/24;* **B41F** *1/10*

U.S. Cl. 101—193 **22 Claims**



1. In an imprinting device of the type wherein material to be printed is moved into an impact marking zone between a movable head and a fixed head one of which includes marking indicia thereon, in which a transfer tape is moved through the marking area between the material and the marking indicia from a supply means and is received by a takeup means by a drive, the improvement wherein:

the supply means comprises a rotatable supply reel mounted with its axis of rotation parallel to the direction of tape travel through the marking zone and a plurality of transfer

tapes of different colors wound upon one another as a multilayer structure on said supply reel;

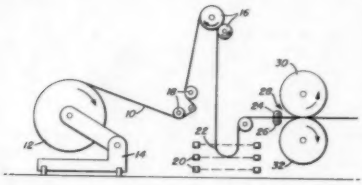
and comprising a guide structure mounted between said supply reel and the marking zone including means for separating the multilayer structure into the individual tapes and directing the tapes towards the marking zone parallel and coplanar to one another, the individual tapes being positioned at the marking zone in parallel side by side coplanar relationship in a plane normal to the movement of the indicia, the indicia dimensioned to imprint the material by all of the tapes simultaneously.

4,416,200

PAPER FEED MECHANISM FOR ROTARY DIE CUTTER

William S. Yon, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Sep. 29, 1982, Ser. No. 428,152
Int. Cl.³ B41F *13/04*
U.S. Cl. 101—228 6 Claims



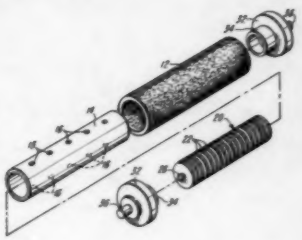
1. System for eliminating the untreated portions of a web while producing a series of treated areas along the length of the web for the purpose of eliminating waste between treated areas and permitting the two-stage treatment of areas during successive revolutions of the treatment rolls, comprising a pair of parallel treatment rolls carrying treatment means operative at the aligned centerlines of the rolls to effect treatment, said treatment means including a trailing edge and a leading edge, said treatment means gripping and forwardly propelling the web, at the peripheral velocity of the rolls, while effecting treatment, a pair of feed rolls between which the web passes, the feed rolls in synchronization with the treatment means, traveling under the propulsion of the web when the web is engaged by the treatment means and controlling the travel of the web when the web is released by the treatment means, feed roll drive means for producing relative forward and reverse movement of the feed rolls independently of the web propulsion thereof, said drive means serving to drive at least one of the feed rolls through a cycle at a peripheral velocity equal to the propelled velocity of the web imparted thereto by the treatment rolls in the forward direction of movement of the web for a first adjustable distance from a point prior to alignment of the trailing edge of the treatment means with the aligned rolls' centerlines to an adjustable point beyond the aligned centerlines corresponding to a point at or beyond disengagement of the trailing edge of the treatment means from the web, and for a second adjustable distance from a point at or prior to engagement of the leading edge of the treatment means, prior to the aligned centerline of the rolls, to a point beyond the aligned centerlines, and, between disengagement of the trailing edge from the web and engagement of the leading edge with the web, drives the feed rolls in a reverse direction at a velocity equal to the forward velocity of the web for a third distance at least as great as the combined first and second distances.

4,416,201

INK ROLLER ASSEMBLY WITH CAPILLARY INK SUPPLY

John R. Kessler, West Carrollton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Nov. 18, 1981, Ser. No. 322,459
Int. Cl.³ B41F *31/14;* B41L *27/16*
U.S. Cl. 101—348 7 Claims



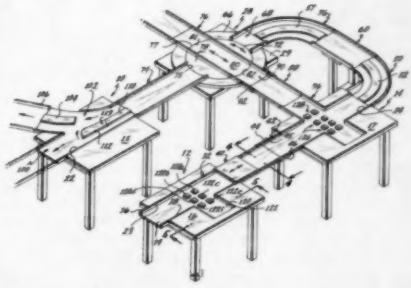
7. An ink roller assembly adapted to provide a uniform application of ink over an extended period of use, comprising a cylindrical sleeve of flexible and porous ink retaining material, a substantially rigid cylindrical support tube within said sleeve for supporting said sleeve, a generally cylindrical ink retaining unit disposed within said tube, means for closing the opposite ends of said support tube, said ink retaining unit including a series of axially spaced generally circular walls having integral central hub means, said hub means rigidly connecting said series of walls together to define therebetween a series of axially spaced annular ink retaining storage chambers each having a width predetermined by said hub means and adapted to receive and store a supply of ink, said walls of said ink retaining unit having an outer diameter generally equal to the inner diameter of said support tube, the spacing between adjacent said walls being greater than the thickness of each said wall, and means defining a plurality of openings through said support tube to provide for a controlled flow of ink from said annular ink retaining chambers into said sleeve.

4,416,202

CONVEYOR BENCH/WORK STATION WITH SHUNT

Jack Rooklyn, Northridge, Calif., assignor to Industrial Management Co., Chatsworth, Calif.

Filed May 15, 1981, Ser. No. 263,773
Int. Cl.³ B61J *1/00*
U.S. Cl. 104—88 4 Claims



1. In a conveyor system, in combination, means providing a trackway having a flat bottom and side flanges extending between a plurality of work stations where work pieces or parts are to be transferred between work stations a carrying truck movable along the trackway between work stations, the

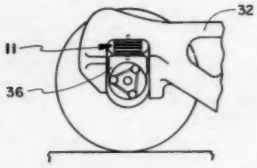
truck having supporting means provided by ball castors in fixed postions whereby the truck can move in different directions, the said truck having guide rollers at corners thereof on vertical axes positioned to engage the side flanges of the trackway, the trackway having portions including change in direction which can be tranversed by the truck, the trackway having guide elements at said portions, the truck having additional guide rollers on vertical axes at intermediate positions on two sides of the truck, positioned to engage said elements whereby the truck is positively guided while changing direction.

4,416,203

RAILWAY VEHICLE LAMINATED MOUNT SUSPENSION

James W. Sherrick, Edinboro, Pa., assignor to Lord Corporation, Erie, Pa.

Continuation of Ser. No. 195,969, Oct. 10, 1980, abandoned.
This application Jun. 14, 1982, Ser. No. 388,286
Int. Cl.³ B61F *5/30*; F16F *1/40, 1/44*
U.S. Cl. 105—224.1 **10 Claims**



1. A mount for providing flexibility and wheel load equalization between the undercarriage and axles of a vehicle comprising:

a top plate and a bottom plate;

a body of elastomeric material disposed between and attaching to said top and bottom plates;

a plurality of shim means disposed at spaced intervals within said body of elastomeric material, said shim means dividing said body of elastomeric material into a plurality of individual layers;

a bearing plate disposed between and attaching to two of said elastomer layers such that at least one of said elastomer layers is disposed between said bearing plate and top and bottom plates;

at least two lower pin means attaching at a spaced interval to said bottom plate and extending downwardly therefrom;

at least two upper pin means, said upper pin means extending downwardly from said top plate through at least one of said elastomer layers and attaching to said bearing plate, whereby upon application of a normal force to said top plate of said mount each of said elastomer layers deflect in compression, and upon application of a lateral force to said mount only said at least one of said elastomer layers disposed between said bearing plate and said bottom plate deflects in shear, said elastomer layers disposed between said top plate and said bearing plate being prevented from deflecting in shear by said upper pin means extending therebetween.

8. In a railway vehicle mount of the type including a body of elastomeric material having first and second opposite ends respectively attachable to first and second vertically spaced and relatively moveable vehicle components for compressive deflection of said body upon relative vertical movement of said vehicle components toward each other and for lateral shear deflection of said body upon relative horizontal movement between said vehicle components, the improvement comprising:

rigid means for increasing the lateral shear spring rate of said body in relation to the compression spring rate thereof;

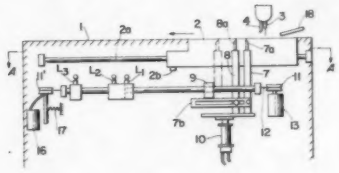
said rigid means including (a) a bearing plate member extending through and bonded to said elastomer body in spaced and generally parallel relationship to said opposite ends thereof, and (b) pin means fixedly connected to and extending from said bearing plate member to one of said ends of said body for preventing lateral shear deflection of a first portion of said body between said plate and said one end of said body, and for restricting lateral shear deflection of said body to a second portion thereof between said bearing plate member and the other of said ends of said body; whereby upon relative vertical movement of said vehicle components towards each other both of said portions of said body deflect in compression, and upon relative horizontal movement between said vehicles components only said second portion of said body deflects in lateral shear.

4,416,204

AUTOMATIC PIPING MACHINE

Akira Kaze, Sakai, Japan, assignor to Eagle Industry Co., Ltd., Osaka, Japan

Filed Oct. 8, 1980, Ser. No. 194,949
Claims priority, application Japan, Dec. 19, 1979, 54-165850
Int. Cl.³ D05B *3/00*
U.S. Cl. 112—68 **10 Claims**



1. A pocket forming apparatus having a center knife, two side needles and two corner cut knives, comprising:

a sewing plate having means for carrying a fabric material thereon, a drag fixed on said sewing plate such that the drag engages limit switches to start and stop said center knife and said two side needles,

said two corner cut knives being essentially aligned with the line of travel of the center knife, and the distance between the corner cut knives being determined by the position of a stopper,

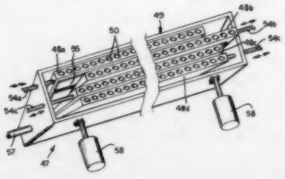
and adjusting means for mechanically changing the distance between the limit switches for said starting and stopping simultaneously and equally with changing of the distance between said two corner cut knives.

4,416,205

YARN FEEDING APPARATUS

Jack M. Schwartz, Rte. 1, Fairmont, Ga. 30139

Division of Ser. No. 209,735, Nov. 24, 1980, Pat. No. 4,351,691.
This application Jun. 21, 1982, Ser. No. 390,398
Int. Cl.³ D05C *15/00*
U.S. Cl. 112—79 R **2 Claims**



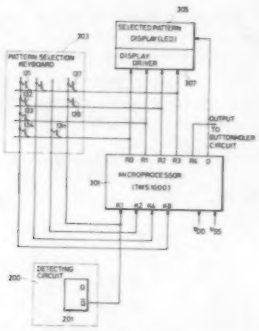
1. Apparatus for feeding yarns to a tufting machine or te like, comprising:

a housing;
a plurality of yarn support members carried by said housing;
each yarn support member having a plurality of yarn feeding tubes aligned on a predetermined first path;
displacement means operatively associated with at least one of said support members to selectably and individually displace said one support member relative to the other support members, along said first path; and
movement means operative to displace said housing, together with each yarn suport member, along a second path substantially transverse to said first path, so as to place a selected one of said yarn support members in operative yarn feeding alignment with the tufting machine or the like.

4,416,206
CONTROL FOR AUTOMATIC BUTTONHOLE APPARATUS IN ZIGZAG SEWING MACHINE

Nobuyoshi Matsumura, Yao, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan

Filed Jun. 8, 1981, Ser. No. 271,572
Claims priority, application Japan, Sep. 5, 1980, 55-123810
Int. Cl.³ D05B *3/06*
U.S. Cl. 112—158 B **13 Claims**



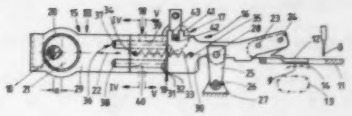
1. An automatic buttonholing apparatus in a zigzag sewing machine, comprising:
selecting means including at least a pattern sewing selecting switch for selecting pattern sewing and a buttonholing selecting switch for selecting buttonholing,
means for generating an electric signal corresponding, respectively, to operation of said pattern sewing selecting switch or of said buttonholing selecting switch,
a presser bar means,
an attachment affixed to said presser bar means for said buttonholing,
detecting means for detecting that said attachment is affixed to said presser bar means, and
means responsive to the output of said detecting means to act on said electric signal generating means for rendering ineffective the generation of the electric signal corresponding to the operation of said pattern sewing selecting switch.

4,416,207
BLIND STITCH SEWING MACHINE

Erwin Maier, Koengen, Fed. Rep. of Germany, assignor to Maier-Unitas GmbH, Koengen, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,557
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113088
Int. Cl.³ D05B *1/24, 27/22*
U.S. Cl. 112—178 **12 Claims**

1. A blind stitch sewing machine comprising a stitch plate having an opening; a plunger below said stitch plate moveable in a predetermined direction; a needle above the stitch plate swingable in a direction transverse to said predetermined direction; a fabric feeder extending from above through said opening in said stitch plate; means for moving said fabric feeder along a substantially elliptical path between a forward and a rearward end position against at least one pressure foot and including a main drive shaft and transmission means between said main drive shaft and said fabric feeder; means in

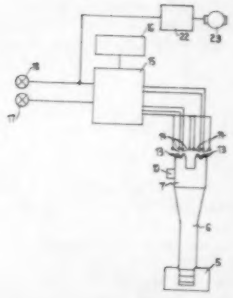


said transmission means for stitch shortening and tacking and comprising coupling means normally coupling said drive shaft to said fabric feeder so that the latter is moved along said substantially elliptical path between said forward and said rearward end positions during rotation of said drive shaft; and control means moveable between a first position holding said fabric feeder in said forward end position to thereby disengage said coupling means and a second position out of engagement with said fabric feeder to reengage said coupling means.

4,416,208
AUXILIARY DEVICE FOR A SEWING MACHINE

Karl Nufer, Steckborn, Switzerland, assignor to Fritz Gegauf Ag Bernina-Nachmaschinenfabrik, Steckborn, Switzerland

Filed May 29, 1981, Ser. No. 268,138
Claims priority, application Switzerland, Aug. 26, 1980, 6409/80
Int. Cl.³ D05B *29/12*
U.S. Cl. 112—240 **7 Claims**



1. In a sewing machine of the type having variable machine set ups corresponding to different machine sewing operations and having interchangeable presser feet corresponding to specific set ups, an auxiliary device for indicating the attachment of a presser foot not corresponding to a determined set up, said device comprising:
first means for delivering information corresponding to the type of presser foot in response to presser foot insertion into the machine;
second means for delivering information corresponding to the set up of the machine;
electronic means connected to said first and second means for receipt and comparison of the information delivered by said first and second means and for determination if the inserted presser foot is of the type corresponding to the set up; and
indicating means connected to said electronic means for indi-

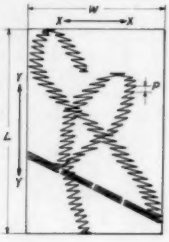
cating to a machine operator if the presser foot corresponds to the machine set up.

4,416,209

METHOD FOR STITCHING ORNAMENTAL LETTERS BY SEWING MACHINE

Hanyu Susumu, Hachioji, Japan, assignor to Janome Sewing Machine Industry Co., Ltd., Japan

Filed Apr. 22, 1981, Ser. No. 256,429
Claims priority, application Japan, May 10, 1980, 55-61256
Int. Cl.³ D05C 5/04
U.S. Cl. 112—266.1 **2 Claims**



1. A method of stitching a series of ornamental letters with a sewing machine which is incorporated with a memory storing stitch control data for controlling a needle and a fabric feeding device to produce stitches of a selected pattern, said method comprising the steps of:

(a) producing a series of stitches in a zig-zag pattern in response to said stitch control data,

(b) feeding the fabric being stitched on alternate stitches in the direction of said series of characters to form the stitches closely adjacent each other, and

(c) said stitches defining the height of the letters in the direction of lateral swinging movement of the needle and the width of the letters in the direction of fabric feeding movement of the fabric feeding device, respectively.

4,416,210

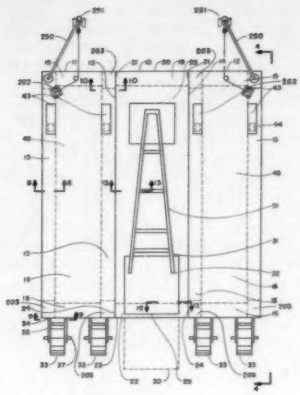
DRILL BARGE TRANSPORT BY SURFACE EFFECT VEHICLES

Ray S. Lacy, Jr., and Thomas P. Johnson, both of P.O. Box 205, Orange, Tex. 77630

Filed Jul. 11, 1980, Ser. No. 167,722
Int. Cl.³ B60V 1/06
U.S. Cl. 114—67 A **5 Claims**

1. A method for the transport of a drilling rig over variable terrain such as marshlands, dry land and water, comprising the steps of:

mounting sufficient equipment including a drilling rig for the drilling of a well on a drill barge such that when in transport configuration, the distribution of both dead loads and variable loads thereon may be made conducive to the balance of the barge; providing the front and rear ends only of the barge with a surface effect skirt; providing a first and a second surface effect vehicle, each having means for its own movement; positioning of the surface effect vehicles along opposite sides of the barge; detachably and sealingly connecting the surface effect vehicles to the sides of the barge; activating the surface effect vehicles by flowing compressed air under them and also flowing compressed air under the barge from at least one of the vehicles so as to lift and transport the barge to a



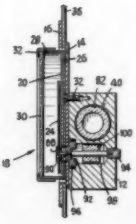
desired location for the drilling of a well; and lowering the barge.

4,416,211

INDICATOR DEVICE WITH CALIBRATION MEANS

Leslie J. Hoffman, 821 Derby-Milford Rd., Orange, Conn. 06477

Filed Nov. 4, 1981, Ser. No. 318,312
Int. Cl.³ G01D 5/06, 5/42
U.S. Cl. 116—204 **31 Claims**



1. An adjustable indicating device adapted to enable its range to be expanded or contracted, with compensatory "zero" adjustment, comprising in combination:

(a) a scale plate having indicia thereon in a housing representative of a range of values,

(b) a pivotally mounted indicating member movable in an arc over said scale plate and adapted to designate various values thereon,

(c) means operationally coacting with means that is responsive to a change in a condition, for shifting said indicating member over said scale plate,

(d) said shifting means comprising a follower permanent magnet, comprising means for mounting said follower magnet for rotative movement, and comprising a driving permanent magnet which shifts in response to changes in said condition and which is adapted to react with the said follower magnet,

(e) adjustable magnetic means comprising a trim permanent magnet disposed in said housing within the sphere of influence of the driving permanent magnet and the follower permanent magnet, for altering the reaction between said driving and follower permanent magnets so as

to effect either an expansion or else a contraction of the range of movement of said indicating member as the driving permanent magnet responds to a predetermined change in said condition, and

(f) "zero" mechanical adjustment means providing an adjustable connection between the indicating member and the follower permanent magnet, thereby to enable the indicating member to be adjusted to a "zero" position with respect to the scale plate, for either an expanded or a contracted range of the indicating member.

4,416,212

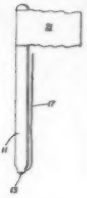
RESCUE SIGNAL

Thomas L. Howard, 1972 Scudder Dr., Akron, Ohio 44320

Filed Apr. 29, 1981, Ser. No. 258,664

Int. Cl.³ G01B *1/02*; B64B *1/50*

U.S. Cl. 116—210 **9 Claims**



1. An elongated inflatable rescue signal comprising:

an elongated, hand-held inflatable tubular member having a signal flag affixed to the upper portion thereof and a mouthpiece having a tube and one-way valve for inflation of said tubular member affixed to the lower portion thereof, said elongated inflatable tubular member being constructed of a relatively thin, flexible, but nearly inextensible material, so as to enable the folding of said signal into a compact package for storage and the subsequent erection thereof by blowing of adequate air into said tubular member through the mouthpiece until said member is fully inflated, thereby providing a semi-rigid staff for support of the signal flag.

4,416,213

ROTARY COATING APPARATUS

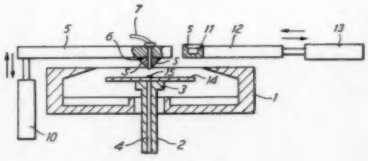
Fumio Sakiya, Ibara, Japan, assignor to Tazmo Co., Ltd., Japan

Filed Feb. 9, 1982, Ser. No. 347,220

Claims priority, application Japan, Feb. 14, 1981, 56-20318

Int. Cl.³ B05C *11/08*, *13/02*

U.S. Cl. 118—52 **4 Claims**



1. A rotary coating apparatus comprising:

(a) a nozzle for depositing a coating liquid,

(b) a first cylinder for moving said nozzle in a vertical direction for a predetermined distance,

(c) a cap normally covering the underside of said nozzle,

(d) a second cylinder for horizontally shifting said cap relative to said nozzle to remove said cap from said nozzle for depositing said coating liquid, and

(e) a rotatable substrate support means for supporting a substrate adjacent said nozzle, said first cylinder lowering said nozzle to just above the surface of said substrate.

4,416,214

COATING APPARATUS

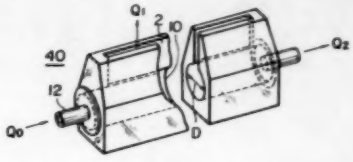
Yasuhisori Tanaka, and Hiroshi Chikamasa, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 274,704, Jun. 17, 1981. This application Feb. 23, 1982, Ser. No. 351,387

Claims priority, application Japan, Jul. 8, 1980, 55-92282

Int. Cl.³ B05C *3/02*

U.S. Cl. 118—410 **3 Claims**



1. An extruder for supplying a coating solution onto a surface of a continuously-run flexible belt-shaped support comprising: an extruder body having a solution pool formed therein and a slit extenting longitudinally therefrom, said solution pool communicating with said slit, a coating solution inlet port formed at one end of said extruder body along a length wise direction of said slit, and a coating solution discharge port formed in said extruder body at the end thereof opposite said end in which said coating solution supplying port is formed.

4,416,215

APPARATUS FOR FABRICATING GRAVURE PRINTING CYLINDERS WITH SYNTHETIC RESIN SURFACE

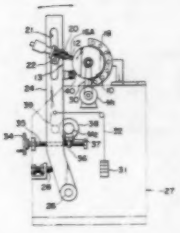
Eiichi Tachibana, Funabashi, and Shinichi Hikosaka, Musashino, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Division of Ser. No. 170,156, Jul. 18, 1980, Pat. No. 4,339,472. This application Apr. 26, 1982, Ser. No. 371,996

Claims priority, application Japan, Jul. 27, 1979, 54-95734

Int. Cl.³ B05C *3/18*, *11/02*

U.S. Cl. 118—642 **8 Claims**



1. Apparatus for applying a synthetic resin solution spirally to the surface of a cylindrical base, comprising:

means for supporting and rotating the base;

a resin solution retainer disposed along and closely adjacent to the base to define therebetween a sump for retaining the resin solution;

means for moving the solution retainer slowly away from the base to cause the resin solution in the sump to flow onto the surface of the base for application of the solution to the base surface as a spirally laid layer, comprising a substantially vertical lever disposed adjacent to the base and pivotally supported at its lower end for movement

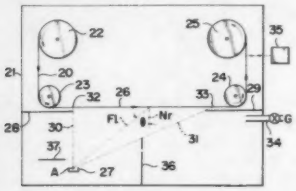
toward and away from the base, said lever supporting adjustably thereon said solution retainer;
means for moving said lever and thereby the solution retainer away from said base; and
drying means disposed along said base to dry the solution applied to the base surface.

4,416,216

APPARATUS FOR FORMING AN INHOMOGENEOUS OPTICAL LAYER

Kazuo Nakamura, Tokyo; Hirotsugu Mizorogi, Ebina, and Akihiko Isao, Sakura, all of Japan, assignors to Ulvac Seimaku Kabushiki Kaisha and Nihon Shinku Gijutsu Kabushiki Kaisha, both of, Japan

Filed Apr. 29, 1982, Ser. No. 373,144
Claims priority, application Japan, Jul. 31, 1981, 56-119149
Int. Cl.³ B05D *1/34, 5/06*
U.S. Cl. 118—696 **4 Claims**



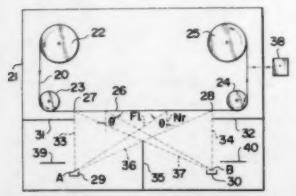
1. An apparatus for forming an inhomogeneous optical layer on a surface of a substrate comprising a vacuum vessel, means for moving the substrate along a travelling path in the vacuum vessel, said travelling path having a path section or a number of path sections, source means for evaporating an evaporation substance in the vacuum vessel, deposition rate regulating means for causing the evaporation substance evaporated from the source means to be deposited on the surface of the substrate moving along the travelling path with the depositing rate being varied monotonously along the travelling path in the path section or each of the path sections, and exposure means for causing the deposited evaporation substance to be exposed to reaction gas which is able to react on the evaporation substance.

4,416,217

APPARATUS FOR FORMING AN INHOMOGENEOUS OPTICAL LAYER

Kazuo Nakamura, Tokyo; Hirotsugu Mizorogi, Ebina, and Akihiko Isao, Sakura, all of Japan, assignors to Ulvac Seimaku Kabushiki Kaisha and Nihon Shinku Gijutsu Kabushiki Kaisha, both of, Japan

Filed Apr. 29, 1982, Ser. No. 373,145
Claims priority, application Japan, Jul. 31, 1981, 56-119150
Int. Cl.³ B05D *1/34, 5/06*
U.S. Cl. 118—696 **2 Claims**



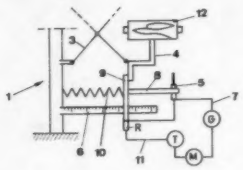
1. An apparatus for forming an inhomogenous optical layer on a surface of a substrate comprising a vacuum vessel, means for moving the substrate along a travelling path in the vacuum vessel, said travelling path having a path section or a number of path sections, two different source means for evaporating their respective different evaporation substances in the vacuum vessel, deposition rate regulating means for causing each of the evaporation substances evaporated from their respective source means to be deposited on the surface of the substrate moving along the travelling path with the depositing rate of each of the substances being varied monotonously along the travelling path in the path section or each of the path sections.

4,416,218

PROCESS AND APPARATUS FOR FEEDING POULTRY

Wolfgang Holz, 8091 Hart-Ramerberg, Oberbayern, Fed. Rep. of Germany

Filed Aug. 7, 1980, Ser. No. 175,957
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2932040
Int. Cl.³ A01K *5/02, 39/012*
U.S. Cl. 119—18 **10 Claims**



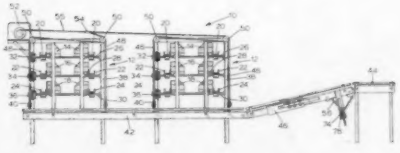
1. A process for feeding a large number of egg laying poultry confined in a number of enclosures and from which the dung and eggs are continuously removed, comprising the steps of: providing a feeding means time controlled to normally provide feed to said poultry during a predetermined time period of each day; determining the average desired weights of said poultry and the weight of feed required for them during feeding to reach a weight of a predetermined value; selecting a small number of said poultry and while feeding the entire large number during said controlled time period monitoring the weights of said selected small number; and terminating the feeding of the entire large number before the end of said controlled time period in response to said weight of said small number reaching said predetermined value.

4,416,219

EGG COLLECTING SYSTEM AND METHOD

Terry A. Dill, Keota, Iowa, assignor to Jefferson Industries Company, Fairfield, Iowa

Filed Jun. 7, 1982, Ser. No. 386,114
Int. Cl.³ A01K *31/16*
U.S. Cl. 119—48 **6 Claims**



6. A method for collecting eggs from a series of vertically tiered confinement cage rows each tier of which has an associated egg-receiving row conveyor with a delivery end, and a horizontally extended vertically movable conveyor means for receiving eggs from said row conveyor means comprising the steps of:
(a) providing a power means on said horizontally extended conveyor means,
(b) moving said horizontally extended conveyor means vertically to one of a plurality of selected positions in

which said horizontally extended conveyor is in egg-receiving relation with at least one of said row conveyor means; and

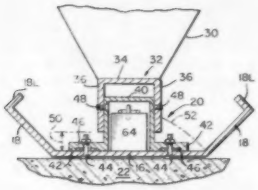
(c) driving each said row conveyor means through said power means only during the period of time in which said horizontally extended conveyor means is in an egg-receiving relation therewith.

4,416,220

AUTOMATIC HOG FEEDING SYSTEM

Larry Dougan, Rte. 1, Iowa Falls, Iowa 50126

Filed Mar. 2, 1982, Ser. No. 354,309
Int. Cl.³ A01K 5/02
U.S. Cl. 119—51.11 **9 Claims**



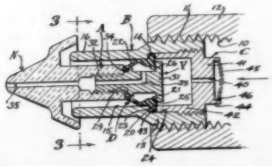
1. Automatic animal feeding apparatus comprising: a horizontally disposed, extended feed trough having a planar bottom portion and upstanding side portions; an inverted U-shaped, open bottomed cover mounted above and coextensively with said trough; a plurality of paddles operatively mounted for movement through said trough and said cover to move feed therethrough; said cover being positioned relative to said trough as to provide a horizontal feed passage gas between the lower edges of said cover and the upper surface of said planar trough portion; said paddles coacting with said gap to controllably urge feed through said gap into said trough; and said cover being vertically adjustably mounted relative to said trough thereby providing predetermined gap vertical dimensions, and controlling the amount of feed urged therethrough.

4,416,221

NIPPLE WATERER AND VALVE

Richard T. Novey, Turlock, Calif., assignor to Alpha Poultry & Livestock Equip., Inc., Victorville, Calif.

Filed Oct. 5, 1981, Ser. No. 308,469
Int. Cl.³ A01K 7/06
U.S. Cl. 119—72.5 **15 Claims**



11. A center flow animal waterer comprised of a body and flow restricting restricting valve-nipple-boot assembly and a retainer-flow control;

the body being an elongated tubular extension for a supply pipe of water under pressure and having a shoulder normal to a central axis and facing an inlet end of the body opening into the supply pipe with a retainer-flow control securing said valve-nipple-boot assembly to the said shoulder,

the valve-nipple-boot assembly including, a boot of elastomeric material engageably positioned against the body shoulder and having a rearwardly faced valve seat and a forwardly extending barrel having a cylindrical flow passage therethrough and a flexible bellows extending from the barrel and radially inward to an anchor ring, a valve element having a stem with a clamp face engageable against a rearward side of the anchor ring and having an imperforate valve disc engageable against the rearwardly faced valve seat and having a flow restricting port opening from an annulus between the stem and boot barrel and opening forwardly therethrough, and a nipple having a clamp face engageable against the forward side of the anchor ring and having a flow passage centrally therethrough and in open communication with the valve element port for water discharge, there being coupling means securing the clamp faces of the valve element and nipple to the boot anchor ring,

and the retainer-flow control including a member upstream of the valve-nipple-boot assembly in the body and having a flow blocking wall with an orifice at least as restrictive as the flow restricting port through the valve element,

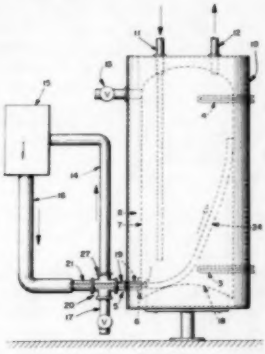
the nipple and valve element being rigid one with the other and carried by the elastic boot for angular displacement laterally of the said axis and tipped removal of the valve disc from the valve seat.

4,416,222

HOT WATER HEATER CIRCUITRY

Charles W. Staats, Yeadon, Pa., assignor to Bradford-White Corportion, Philadelphia, Pa.

Filed May 5, 1981, Ser. No. 260,741
Int. Cl.³ F22B 5/00
U.S. Cl. 122—13 R **4 Claims**



1. Dual flow circuitry, adapted to connect in fluid-communication with an opening in the side of a heated residential hot water tank, containing water having a plurality of temperature layers, said circuitry including a conduit able to carry both an inflowing and an outflowing stream, said conduit comprising:

a. a first cylindrical pipe connected in fluid-sealing relation to said tank opening at one end and connected in fluid-sealing relation to a "cross" pipe fitting at the other end;

b. said "cross" pipe fitting having four openings;

c. a second cylindrical pipe having an annual plug, in fluid-sealing relation to the interior of said second cylindrical pipe, and a centrally disposed tube, in fluid-sealing relation to said annular plug and extending through and annularly spaced from said second cylindrical pipe, said "cross" pipe fitting and said first cylindrical pipe;

d. a valve sealing off one "cross" pipe fitting opening;

e. supplemental residential water heating means having a cold water inflow and a hot water outflow streams, said inflow stream in fluid-communication with the fourth

opening in said "cross" pipe fitting and said outflow stream in fluid-communication with said centrally disposed tube; and

f. said centrally disposed tube being composed of a flexible material such that upon insertion through said opening in said hot water tank said tube extends to an upper predetermined level in said tank.

4,416,223

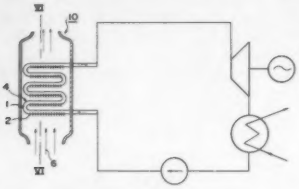
HEAT EXCHANGERS

Kenichi Hashizume, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 151,831, May 21, 1980, abandoned. This application Sep. 10, 1982, Ser. No. 416,470

Int. Cl.³ F22B *37/10*

U.S. Cl. 122—367 C **1 Claim**



1. A heat exchanging method for generating a vapor from a liquid while preventing a dry out condition in the tubes of a heat exchanging device comprising the steps of:

providing a heat exchanging device comprising an inlet located at a lower portion of said heat exchanging device, an outlet located at an upper portion of said heat exchanging device and internal heat transfer tube assemblies mounted in a fluid flow path of said device between said inlet and outlet, each tube assembly comprising a tube and a plurality of plate-like fins secured to the outer surface of said tube to extend radially therefrom, said tubes being arranged horizontally and each of said fins being secured to the outer peripheral surface of only the lower half of an associated tube from one side thereof to the other and functioning to prevent overheating of an upper half of the associated tube;

feeding a high temperature gas into the inlet of said heat exchanging device and through said fluid flow path; and

passing a liquid through said tube assemblies and vaporizing said liquid by heat from said high temperature gas to form within at least one of said tubes a liquid vapor and a thin liquid film along an upper inner wall of said at least one tube, said fins which are only at the lower surface of said tubes preventing the overheating of an upper half of said at least one tube and a drying out of said thin liquid film therein.

4,416,224

INTERNAL COMBUSTION ENGINE

William M. Hobby, 244 Sylvan Blvd., Winter Park, Fla. 32789, and Joseph M. Valdespino, 5023 Golf Club Pkwy., Orlando, Fla. 32808

Filed Jan. 18, 1982, Ser. No. 340,256

Int. Cl.³ F02M *21/02*

U.S. Cl. 123—3 **16 Claims**

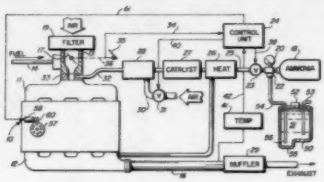
1. An improvement in an internal combustion engine having an auxiliary fuel system comprising in combination:

an internal combustion engine having fuel feed means for feeding a hydrocarbon fuel-air mixture to said engine combustion chambers;

an auxiliary fuel system feeding an auxiliary fuel to said internal combustion engine with said hydrocarbon fuel-air mixture;

a first auxiliary fuel dissociation means for dissociating the fuel in said auxiliary fuel system being fed to said internal combustion engine using exhaust heat from said engine;

a second auxiliary fuel dissociation means for dissociating the fuel in said auxiliary fuel system being fed to said



internal combustion engine when said engine has insufficient heat from said exhaust heat to dissociate said auxiliary fuel, whereby said internal combustion engine runs on dissociated auxiliary fuel in combination with a hydrocarbon fuel-air mixture.

4,416,225

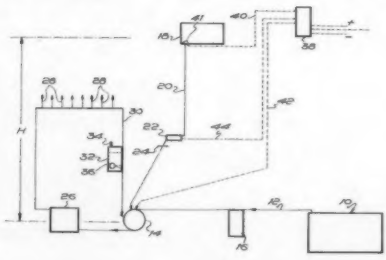
IMPROVEMENTS RELATING TO INTERNAL COMBUSTION ENGINES

Albert B. Constantine, 2 Tintagal, Great Lumley, Chester-le-St. Co. Durham DH3 4NE, England, and Alan D. Walker, Yatton, England, assignors to Albert Constantine and Cadbury Schweppes Transport Services Ltd., both of Birmingham, England

Filed Aug. 7, 1981, Ser. No. 291,097

Int. Cl.³ F02M *25/02*

U.S. Cl. 123—25 E **7 Claims**



1. An internal combustion engine which is set to be run on an emulsion of fuel and water including a water supply line, a fuel supply line, an emulsifier for forming an emulsion of fuel and water supplied from the said lines, the engine having a return line for returning overspill emulsion to be returned to the emulsifier, characterized in that in the return line there is a surge tank having a vent to atmosphere.

4,416,226

LASER IGNITION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Minoru Nishida; Tadashi Hattori; Shinichi Mukainakano, all of Okazaki; Toru Mizuno, Aichi, and Tukasa Goto, Kariya, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Jun. 1, 1982, Ser. No. 383,835

Claims priority, application Japan, Jun. 2, 1981, 56-85308

Int. Cl.³ F02P *23/00*

U.S. Cl. 123—143 B **5 Claims**

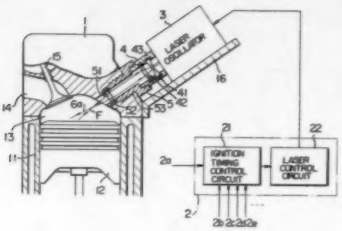
1. A laser ignition apparatus for an internal combustion engine for igniting an air-fuel mixture supplied into a combustion chamber of said engine, comprising:

means for generating a laser beam of a high energy density;

means for controlling the generation of said laser beam in response to an ignition timing signal for said engine; and

means for guiding and directing said laser beam from said laser beam generating means to a predetermined position within said combustion chamber,

said laser beam generating means including a single laser oscillator for generating at least two pulse-shaped laser beams during each compression stroke of said engine, a first laser beam of said two pulse-shaped laser beams



having a high energy density sufficient to cause breakdown of said air-fuel mixture, a second laser beam of said two pulse-shaped laser beams having an energy density lower than said first laser beam but having a longer duration, wherein said single laser oscillator includes means for controlling the production of said first laser beam of high energy density and said second laser beam of lower energy density and said first laser beam is effective to generate a plasma and said second laser beam is irradiated to the plasma before the plasma is diffused.

4,416,227

HOSE JOINT WITH A SHELTERING COVER

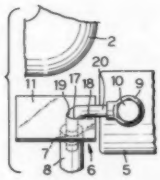
Noriaki Imamura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 18, 1980, Ser. No. 207,888

Claims priority, application Japan, Jul. 24, 1980, 55-101579

Int. Cl.³ F02B *77/11*

U.S. Cl. 123—198 D **8 Claims**



1. A hose joint, adapted to connect a hose to a fluid apparatus disposed in the vicinity of a radiant heat source, comprising:

a tubular portion including a hose attaching portion at one end thereof having a hose fitted thereon, and further including a bent portion bent between said hose attaching portion and another end of the tubular portion;

a connecting portion disposed at said other end of said tubular portion for being connected to a fluid apparatus; and

a plate-like sheltering cover having a U-shape notch therein and secured to said tubular portion between said hose attaching portion and said connecting portion such that the sheltering cover is interposed between the radiant heat source and said hose so as to intercept and disperse radiant heat from the radiant heat source away from said hose, said U-shape notch of the sheltering cover engaging said tubular portion in the neighborhood of said bent portion, said tubular portion sheltering an area formed by said U-shape notch and thereby preventing the radiant heat from reaching said hose through said U-shape notch.

4,416,228

SEPARATELY IGNITED INTERNAL COMBUSTION ENGINE WITH AT LEAST ONE MAIN COMBUSTION CHAMBER AND AN IGNITION CHAMBER

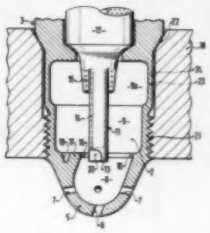
Walter Benedikt, Stuttgart; Reinhard Latsch, Vaihingen, and Hans Schlembach, Mühlacker, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 7, 1982, Ser. No. 337,855

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1981, 3101326; Dec. 5, 1981, 3148296

Int. Cl.³ F02P *1/00*; F02B *3/00*

U.S. Cl. 123—268 **42 Claims**



1. An internal combustion engine, comprising means forming at least one main combustion chamber; means forming a separate ignition chamber separated from said main combustion chamber by a first wall and connected with said main combustion chamber by at least one passage in said wall; ignition means including a center electrode provided in said ignition chamber and forming together with said wall a spark gap, said center electrode having a free end which extends into said ignition chamber and being hollow near said free end and formed as a heat pipe; and an insulator with an insulator shoe which extends into said ignition chamber and supports said center electrode so that said insulator together with said insulator shoe forms an insulating gap.

4,416,229

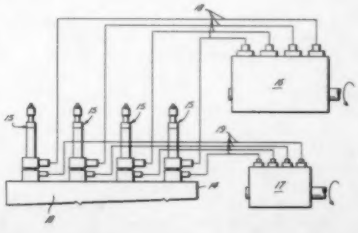
FUEL INJECTION SYSTEM FOR DIESEL ENGINES

Charles D. Wood, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Jun. 29, 1981, Ser. No. 278,653

Int. Cl.³ F02M *43/00*

U.S. Cl. 123—304 **6 Claims**



1. An improved system for operating a diesel engine with a combination of diesel fuel and alternative fuel having a low cetane number, wherein the engine includes at least one cylin-

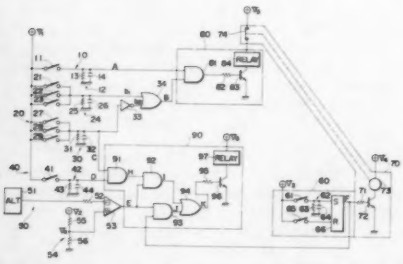
der having a piston therein to form a combustion chamber at one end of the cylinder, comprising a single fuel injector adapted to be connected with the combustion chamber of said cylinder of the engine, said injector including a cavity therein having a port through which fuel may be injected into the combustion chamber and a valve seat about the port, a valve member shiftable between one position on the seat to close the port and another position spaced from the seat to open the port, means which is responsive to the pressure of fuel in the cavity to urge said valve member to open position, means urging the valve member toward closed postition with a force which is independent of such fuel pressure, means for supplying diesel fuel to the cavity of said injector at a location near the valve seat, means for supplying alternative fuel to the cavity of said injector the diesel fuel being supplied at a relatively low pressure which does not move the valve member to open position, the alternative fuel being supplied at a relatively high pressure which is sufficient to move the valve member to open position at intervals just prior to the movement of the piston of the cylinder of the chamber into which the fuel is to be injected into high center position during its compression stroke, and said fuel supplying means including means to prevent the back flow of fuel therein, and thus maintain the cavity filled with fuel, except when alternative fuel is displaced within the cavity by the supply thereto of diesel fuel, whereby a plume of both fuels having the diesel fuel at its tip is injected into said chamber to enable the diesel fuel to be ignited by the compression in the chamber and the alternative fuel to be ignited by the diesel fuel.

4,416,230

ENGINE CONTROL APPARATUS

Shinji Katayose, Tokyo; Masatsugu Ohwada, Yokosuka, and Takashi Oka, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 16, 1982, Ser. No. 408,629
Claims priority, application Japan, Aug. 19, 1981, 56-130469
Int. Cl.³ F02D *33/00*
U.S. Cl. 123—325 **7 Claims**



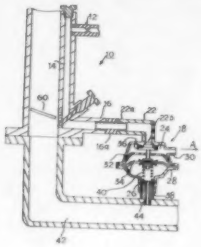
1. An apparatus for controlling an internal combustion engine of an automotive vehicle having a transmission, a clutch, a throttle valve, a brake booster storing therein pressure supplied from an engine intake manifold, and sources for generating signals indicative of: (a) the throttle valve opening at an angle less than a predetermined value, (b) the transmission being in high gear or in neutral, (c) the transmisson being in low gear, (d) the clutch being disengaged, and (e) the engine operating at a speed less than a predetermined value, said apparatus comprising first means for generating a signal (f) when the pressure in the brake booster increases over a first predetermined value, the first means terminating the generation of the signal (f) when the pressure in the brake booster falls below a second predetermined value lower than the first predetermined value, second means for terminating delivery of fuel to the engine upon the occurrence of two conditions indicated by signals (a) and (b), third means for restarting the engine upon the occurrence of three conditions indicated by signals (c), (d) and (e) or upon the occurrence of two conditions indicated by signals (e) and (f), and fourth means for preventing the second means from terminating fuel delivery to the engine upon the occurrence of one condition indicated by signal (f).

4,416,231

LOW SPEED AIR BLEED ABSORPTION REDUCER OIL SAVING DEVICE FOR CARBURETOR

Min D. Lai, 5Fl., No. 7, Alley 21, Lane 239, Pa Ter Rd., Sec. 2, Pan Shiao City, Taipei Hsien, Taiwan, Taiwan

Filed Feb. 22, 1982, Ser. No. 350,702
Int. Cl.³ F02M *23/08*
U.S. Cl. 123—327 **3 Claims**



1. A low-speed air bleed absorption reducer fuel-saving device for connection to the fuel intake tube and the valve of a carburetor for use to save fuel fed to the engine of a land vehicle when the land vehicle to which it is connected is travelling downhill, changing from a lower speed to a higher speed by virtue of gear shifting, or on the point of executing a braking action, the fuel saving device comprising

an air intake control mechanism having a connection to an air purifier,

an air intake bypass porthole connected to said intake control mechanism,

a low speed fuel network connected to said bypass porthole and to the engine of the land vehicle to feed the cylinders of the engine,

said air-intake control mechanism including

a valve gate to block and unblock said air intake bypass porthole from said connection to the air purifier,

said airtake control mechanism having a connection to the fuel intake tube of the carburetor and to a throttle valve of the carburetor

and means connected to said valve gate to automatically move said valve gate between blocking and unblocking positions, with vacuum in the fuel intake tube when the throttle valve is closed moving said means and said valve gate to an unblocking position allowing air from said connection to the air purifier into said air intake contol mechanism to said bypass porthole into sad low-speed fuel network to feed the air to the cylinders of the engines.

4,416,232

ELECTRICAL FUEL INJECTION PUMP GOVERNOR

Makoto Shiozaki; Satoshi Haseda; Jun Tarui, all of Kariya; Osamu Ito, Toyota; Nobuhito Hobo, Inuyama; Yoshihiko Tsuzuki, Toyota; Shizuo Kawai, Kariya, and Hiroshi Sami, Numazu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 13, 1981, Ser. No. 282,955
Claims priority, application Japan, Jul. 14, 1980, 55-96631
Int. Cl.³ F02D *1/04*
U.S. Cl. 123—357 **7 Claims**

1. In a fuel injection pump having a spill ring used for the fuel system of a compressed ignition type internal combustion

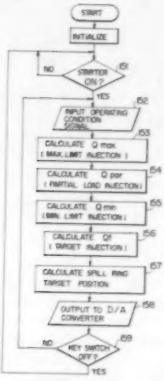
engine, an electrical fuel injection pump governor for optimally regulating the amount of fuel injected in nonlinear relation with the displacement of said spill ring in accordance with the engine running conditions, said governor comprising:

an electromagnetic actuator for driving said spill ring;

an actual position detector for electrically detecting the displaced position of said spill ring and generating an actual position signal;

an engine running condition detector for detecting the engine running condition to generate an electrical detection signal, said engine running condition detector including a rotational speed detector for generating a rotational speed indication signal by detection of the engine rotational speed;

target value calculating means including target injection amount calculator means for calculating the target value



of injection amount corresponding to the detection signal from said running condition detector, memory map means storing data of a plurality of spill-ring target positions corresponding to two parameters of engine rotational speeds and target values of injection amount, and position calculating means capable of searching and reading out desired data of spill-ring target position from said memory map means in correspondence with the two parameters of an engine rotational speed and target value of injection amount wherein different desired data of spill-ring target position can be read out from said map means in order to follow variation in engine rotational speed even with respect to a same target value of injection amount; and

drive means for comparing said target position indication signal with said actual position signal and driving said electromagnetic actuator in accordance with the error between said two signals.

4,416,233

CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

Max Straubel, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 22, 1980, Ser. No. 123,532

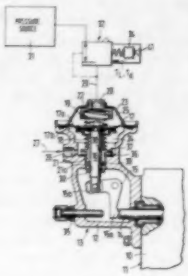
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1979, 2908792

Int. Cl.³ F02D *1/06, 1/14*

U.S. Cl. 123—383 **3 Claims**

1. In a control apparatus for limiting the movement of a supply quantity adjustment member of a fuel metering apparatus for an internal combustion engine in accordance with induced air-pressure in an intake manifold of the engine, which includes a housing, a movable wall disposed within the housing between a first pressure chamber and a counterpart pressure chamber which are defined by the housing and the movable wall, an adjustment member means actuated by the movable wall for limiting the movement of the supply quantity adjustment member, connecting means for connecting the first pressure chamber to the intake manifold of the engine, and restoring means for exerting a force on the movable wall to determine an initial disposition of the movable wall, wherein the movable wall is displaceable by the induced air pressure of the engine against the force of the restoring means, the improvement which comprises:

a pressure source means for generating a reference absolute pressure, including



an absolute pressure controller for maintaining the reference absolute pressure at a constant absolute pressure level, and

engine parameter correcting means for correcting the reference absolute pressure in accordance with an engine parameter wherein the reference absolute pressure increases when the engine parameter changes; and

second connecting means for connecting the pressure source means to the counterpart pressure chamber.

4,416,234

IGNITION SYSTEM SPARK TIMING CONTROL DURING ENGINE CRANKING

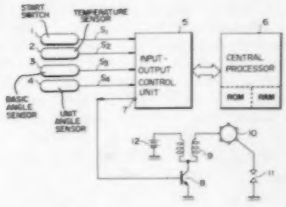
Kenji Ikeura, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 137,000, Apr. 3, 1980, abandoned. This application Jun. 10, 1982, Ser. No. 387,160

Claims priority, application Japan, Apr. 19, 1979, 54-47280

Int. Cl.³ F02P *5/14*

U.S. Cl. 123—424 **2 Claims**



1. A method of controlling an ignition system spark timing for a spark ignition internal combustion engine, comprising the steps of:

(a) sensing the engine temperature and generating an engine temperature signal indicative of the sensed engine temperature;

(b) detecting a mode of operation when the engine is being cranked and generating an output signal;

(c) finding in response to said engine temperature signal and output signal by table look-up in a read only memory a

value of spark advance which corresponds to the sensed engine temperature, said read only memory having a plurality of spark advance values and a plurality of corresponding engine temperature values stored therein, which spark advance values and corresponding engine temperature values define a two dimensional table, said two dimensional table having a first zone in which the values of spark advance decrease with an increase in engine temperature, a second and subsequent zone in which the values of spark advance remain essentially constant with an increase in engine temperature, and a third and subsequent zone in which the values of spark advance increase with an increase in engine temperature, the values of engine temperature in said first zone being lower than the values of engine temperature in said second zone and the values of engine temperature in said second zone being lower than the values of engine temperature in said third zone; and

(d) providing a spark advance determined by said table look-up as a value of spark advance.

4,416,235

IGNITION TIMING CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

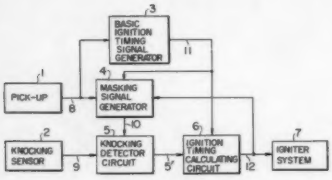
Hiroo Utsumi, Kariya; Yukio Sakakibara, Anjo; Teruyoshi Ito, Kariya; Kiyokane Kaji, and Mitsuyuki Banno, both of Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 14, 1981, Ser. No. 301,748

Claims priority, application Japan, Nov. 19, 1980, 55-165979[U]

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—425 **6 Claims**



1. An ignition timing control apparatus for an internal combustion engine, comprising a pick-up incorporated in a distributor, a circuit for preparing a basic ignition timing indicating signal on the basis of an output signal from said pick-up, a knocking detector circuit for detecting presence or absence of knocking to thereby produce a knocking indicating signal, an actual ignition timing generating circuit responsive to said basic ignition timing indicating signal and said knocking indicating signal for generating an actual ignition command signal which is then applied to an igniter system of said engine, and a masking signal generator circuit responsive to the output signal from said pick-up for producing a masking signal to inhibit operation of said knocking detector circuit for a predetermined period which begins at a time point leading said basic ignition timing by a predetermined crank angle.

4,416,236

AIR-FUEL RATIO CONTROL SYSTEM

Takuro Morozumi, Mitaka, and Hitoshi Suzuki, Niiza, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1981, Ser. No. 333,194

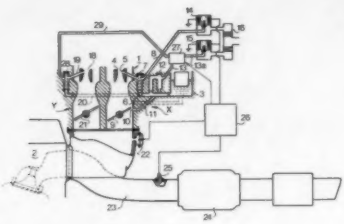
Claims priority, application Japan, Dec. 26, 1980, 55-189095

Int. Cl.³ F02B *33/00;* **F02M** *7/00*

U.S. Cl. 123—438 **3 Claims**

1. In an air-fuel ratio control system for an internal combustion engine having a two-barrel carburetor comprising a primary side having a main metering system and a slow speed system and a secondary side having a main metering system, an induction passage, a throttle valve provided in each side, an exhaust passage, first detector means for detecting the concentration of a constituent of exhaust gases passing through said exhaust passage, two electromagnetic valves for correcting the air-fuel ratio of the air-fuel mixture supplied by said carburetor, electronic control circuit comprising a judging circuit for judging an output signal of said first detector means, and a driving circuit for driving said electro-magnetic valves in dependency on an ouput signal of said first detector means for controlling the air-fuel ratio to a value approximately equal to the stoichiometric air-fuel ratio;

second detector means for producing an ouput signal when said carburetor changes from a primary side operation to the operation by both of the primary and secondary sides,



a first passage connecting the slow speed system of said primary side to one of said electromagnetic valves;

a second passage connecting the main metering system of said secondary side to said one of the electromagnetic valves;

a third passage connecting said main metering system of said primary side to the other electromagnetic valve;

an electromagnetically operated change-over valve for changing the connection between said electromagnetic valve and said first and second passages;

said electromagnetically operated change-over valve being so arranged to normally communicate said electromagnetic valve with said first passage and to communicate said electromagnetic valve to said second passage by said output signal of said second detector means.

4,416,237

METHOD AND AN APPARATUS FOR CONTROLLING THE AIR-FUEL RATIO IN AN INTERNAL COMBUSTION ENGINE

Keiji Aoki, and Masaki Mitsuyasu, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 25, 1982, Ser. No. 352,457

Claims priority, application Japan, Feb. 26, 1981, 56-26066

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—438 **10 Claims**

1. A method for controlling the air-fuel ratio in an internal combustion engine comprising the steps of:

detecting the running speed of the engine for producing a first electrical signal which indicates the detected speed;

detecting the intake manifold pneumatic pressure of the engine for producing a second electrical signal which indicates the detected pressure;

detecting the concentration of a predetermined component in the exhaust gas for producing a third electrical signal which indicates the detected concentration;

detecting the degree of the acceleration or deceleration of the engine for producing a fourth electrical signal which indicates the detected acceleration or deceleration degree;

calculating, depending upon the first and second electrical

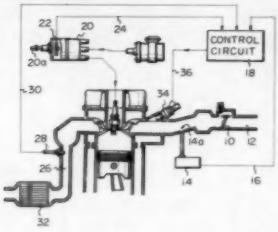
signals, a value which corresponds to a basic fuel feeding rate to the engine;

calculating, depending upon the third electrical signal, a first correction factor which corresponds to the deviation of the actual air-fuel ratio in the engine from a desired air-fuel ratio;

judging, depending upon the fourth electrical signal, whether or not the engine is under the accelerating or decelerating condition;

when the engine is under the accelerating or decelerating condition, calculating, depending upon the fourth electrical signal, a second correction factor by using a function which represents a relationship between the acceleration or deceleration degree and the second correction factor;

correcting the calculated value related to the fuel feeding rate in accordance with the calculated first correction factor;



when the engine is under the accelerating or decelerating condition, correcting the corrected value related to the fuel feeding rate in accordance with the calculated second correction factor;

adjusting, depending upon the corrected value related to the fuel feeding rate, the actual fuel feeding rate to the engine;

repeating the above sequence of steps so that the air-fuel ratio in the engine is controlled within a predetermined range;

detecting the change of the first correction factor during the accelerating or decelerating condition; and

correcting, in response to the detected change of the first correction factor, said function related to the second correction factor.

4,416,238

FUEL INJECTION SYSTEM

Heinrich Knapp, Leonberg; Rudolf Sauer, Benningen; Rudolf Krauss, Stuttgart, and Udo Hafner, Lorch, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 7, 1982, Ser. No. 375,900

Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118168

Int. Cl.³ F02M *55/00*

U.S. Cl. 123—470 **3 Claims**

1. In a fuel injection system for an internal combustion engine which includes

an air intake tube,

a fuel injection valve for injecting fuel into the air intake tube, the fuel injection valve including:

an axis,

an outer or circumferential surface extending about the axis,

a fuel inflow groove which extends radially inward from the outer surface of said fuel injection valve and which includes at least one fuel inlet opening therein,

a fuel outflow groove which extends radially inward from the outer surface of said fuel injection valve and which is axially offset from said fuel inflow groove by an annular protrusion of said fuel injection valve,

said fuel outflow groove including at least one fuel outlet opening therein,

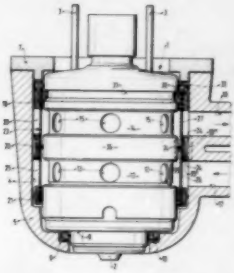
a holder body which surrounds the fuel injection valve and includes

a guide opening in which the fuel injection valve is disposed,

a fuel supply line which opens into the guide opening adjacent the fuel inlet opening of the fuel injection valve,

a fuel outflow line which opens into the guide opening adjacent the fuel outlet opening of the fuel injection valve,

a fuel filter, which is disposed in the guide opening of the holder body and extends axially to cover the fuel inlet and fuel outlet openings of the fuel injection valve, the fuel filter including



a plurality of annular elastic supporting bodies for radially guiding the fuel injection valve in the guide opening of the holder body, wherein the plurality of annular elastic supporting bodies includes a middle supporting body opposite said annular protrusion for sealing off the fuel inlet openings and the fuel supply line from the fuel outlet openings and the fuel outflow line, and

a degassing conduit provided in said annular protrusion which leads from the fuel inflow groove to the fuel outflow groove.

4,416,239

ELECTRONIC CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH CORRECTION MEANS FOR CORRECTING VALUE DETERMINED BY THE CONTROL SYSTEM WITH REFERENCE TO ATMOSPHERIC AIR PRESSURE

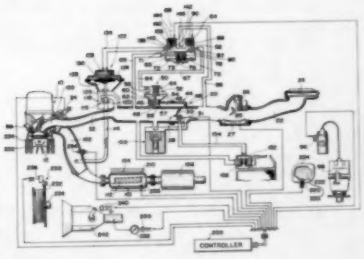
Sadao Takase, and Akio Hosaka, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 31, 1981, Ser. No. 297,929

Claims priority, application Japan, Sep. 4, 1980, 55-121769

Int. Cl.³ F02M *51/00, 25/06;* **F02P** *3/02*

U.S. Cl. 123—478 **17 Claims**



11. An electronic control system for an internal combustion engine for controlling engine operation based on at least an intake vacuum pressure of the engine and an atmospheric air pressure comprising:

a pressure sensor for measuring a pressure introduced and producing a pressure signal representative of said pressure introduced;

switching means, associated with said pressure sensor, for selectively introducing an intake vacuum pressure and an atmospheric air pressure into said pressure sensor; and

a control unit, associated with said switching means to produce a periodic signal for operating said switching means for switching introduction of said intake vacuum pressure and said atmospheric pressure at a given timing, said control unit receiving said pressure signal from said pressure sensor and producing a control signal for controlling the engine operation.

4,416,240

DEVICE AND METHOD FOR CONTROLLING FUEL INJECTED INTERNAL COMBUSTION ENGINE PROVIDING HOT DECELERATION ENRICHMENT

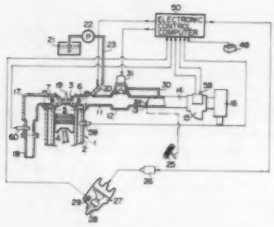
Hiroki Matsuoka, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Apr. 27, 1982, Ser. No. 372,387

Claims priority, application Japan, Jun. 4, 1981, 56-86295

Int. Cl.³ F02D *17/00*

U.S. Cl. 123—493 **14 Claims**



1. For an internal combustion engine comprising an intake manifold and a fuel injection valve fitted to said intake manifold which is selectively opened and closed by selective supply of an actuating signal thereto and which when so opened injects liquid fuel into said intake manifold, said internal combustion engine having an operational cycle:

an engine control method, comprising the processes, repeatedly and simultaneously performed, of:

(a) sensing the flow rate of air into said intake manifold with an intake air flow meter which measures the flow rate of air into said intake manifold and which outputs an intake air flow rate signal representative of said air flow rate;

(b) sensing the revolution of said internal combustion engine with an engine revolution sensor which responds to revolution of said internal combustion engine and which outputs an engine revolution signal representative of said internal combustion engine revolution;

(c) determining at a sequence of instants separated by successive intervals successive instances of the value of a first quantity approximately representing the proper amount of fuel to be injected through said fuel injection valve, said determination being at least partly based upon said intake air flow rate signal and said engine revolution signal;

(d) performing the following processes in the specified order:

(d0) determining the current value of a second quantity approximately representing the actual amount of fuel to be injected through said fuel injection valve, said determination being at least partly based upon said intake air flow rate signal and said engine revolution signal;

(d1) determining an average value of all said successive instances of the value of said first quantity approximately representing the proper amount of fuel to be injected through said fuel injection valve which have been determined in some time interval up to the present;

(d2) comparing the current value of said first quantity approximately representing the proper amount of fuel to be injected through said fuel injection valve with said average value and based thereupon determining whether or not said internal combustion engine is being decelerated at the present time, by comparing said current value with said average value;

(d3) if, according to said comparison, it is so determined that said internal combustion engine is being decelerated at the present time, and if it is also determined that said internal combustion engine is fully warmed up at the present time, adjusting the current value of said second quantity approximately representing the actual amount of fuel to be injected through said fuel injection valve by increasing it somewhat, so as to produce an adjusted value corresponding to the actual fuel amount;

and optionally

(d4) further adjusting said adjusted value corresponding to the actual fuel amount;

and

(e) at proper fuel injection points in said operational cycle of said internal combustion engine, modifying said actuating signal according to the current adjusted value of said second quantity and supplying the modified actuating signal to said fuel injection valve in such a fashion as to cause said fuel injection valve to open for a time period which will allow an amount of fuel approximately equal to the fuel amount represented by said current adjusted value of said second quantity corresponding to the actual fuel amount to pass through said fuel injection valve so as to be injected into said intake manifold.

4,416,241

MIXTURE FORMATION SYSTEM FOR MIXTURE-COMPRESSING INTERNAL COMBUSTION ENGINES WITH EXTERNALLY SUPPLIED IGNITION

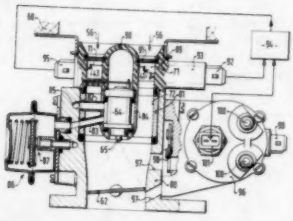
Heinrich Knapp, Leonberg; Peter Romann, Stuttgart, and Rudolf Sauer, Benningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 27, 1981, Ser. No. 287,002

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1980, 3032066

Int. Cl.³ F02M *51/00*

U.S. Cl. 123—494 **14 Claims**



1. A mixture formation system for mixture-compressing internal combustion engines with externally supplied ignition, comprising:

a generally tubular air intake fitting having an electromagnetic injection valve element disposed concentrically therein and upstream of a throttle device disposed in said fitting,

an air-flow rate meter disposed upstream of a fuel outlet location of said valve element directed coaxially relative to said air intake fitting for measuring the flow of intake

air, means defining an annular gap which surrounds said injection valve element, said air-flow rate meter including at least one temperature-dependent resistor disposed in said annular gap surrounding said injection valve element upstream of said fuel outlet location, and means for regulating the temperature of said resistor in accordance with flowing air mass to a constant value,

the inner diameter of said annular gap extending concentrically with the outer diameter of said injection valve element, and

the outer diameter of said annular gap extending concentrically with the inner diameter of said air intake fitting.

4,416,242

INTAKE HEATING APPARATUS OF AN INTERNAL COMBUSTION ENGINE

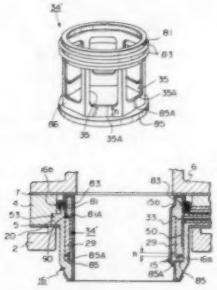
Keigo Kato, and Yosio Kuroiwa, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 22, 1982, Ser. No. 351,310

Claims priority, application Japan, Oct. 5, 1981, 56-157533

Int. Cl.³ F07M *31/00*

U.S. Cl. 123—549 **6 Claims**



1. An intake heating apparatus of an internal combustion engine comprising a hollow heater vessel, which is placed in an intake passage between a fuel supply means and a cylinder of the engine to heat an intake, said hollow heater vessel comprising: an inner pipe having therein a mixture passage which is aligned with the intake passage; an outer pipe in which said inner pipe is press-fitted; an insulating annular PTC element holder which is located between said inner pipe and said outer pipe and which has holes in which PTC elements are fitted and held; and an annular elastic electrode which is connected to an external electrical power supply and is located between the PTC elements and the outer pipe, so that the electrode comes into contact with the PTC elements, whereby the inner pipe is heated by heating the PTC elements to heat the intake passing through the heater vessel, said holes of the PTC element holder having lower edges which are off-set from the lower end of the elastic electrode.

4,416,243

VACUUM CONTROL VALVE

Mitikatu Naito, Nagoya; Kiyotosi Yano, and Kazuo Itou, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 20, 1982, Ser. No. 370,069

Claims priority, application Japan, Apr. 21, 1981, 56-57729[U]

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **3 Claims**

1. A vacuum control valve for controlling an amount of exhaust gas to be recirculated into combustion chambers of an engine comprising:

a cover and a housing;

a vacuum port formed on said cover and to be connected with a vacuum source;

an output port formed on said cover and to be connected with a diaphragm chamber of a EGR valve of said engine;

a vacuum modulating chamber formed in said cover and communicated with said output port and having a diaphragm;

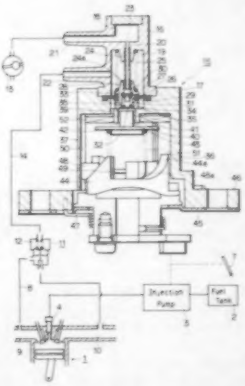
a movable member coupled with an opening of said diaphragm so as to be moved with said diaphragm, said movable member having therein a valve chamber and a valve port opening to said vacuum modulating chamber, said movable member further having a hole for communicating said valve chamber with the atmosphere;

a valve member disposed in said valve chamber and facing to said valve port;

a first spring disposed in said valve chamber for biasing said valve member towards said valve port;

a pipe disposed in said vacuum modulating chamber, one end thereof being communicated with said vacuum port and the other end projecting into said valve port for introducing a negative pressure from said vacuum source into said vacuum modulating chamber;

a second spring disposed in said vacuum modulating chamber and biasing said movable member in such a direction



that said movable member is moved away from said pipe, whereby when the negative pressure in said vacuum modulating chamber exceeds a preset load determined by the biasing force of said second spring said valve member seats on said other end of said pipe for cutting off the communication between said vacuum port and said vacuum modulating chamber and said vacuum modulating chamber is communicated with said valve chamber for introducing the atmospheric pressure into said vacuum modulating chamber through said valve port, thereby to modulate the pressure in said vacuum modulating chamber at a predetermined value in accordance with said preset load;

a cam chamber formed in said housing;

a cam member rotatably disposed in said cam chamber and being linked with an acceleration pedal, wherein a diameter of said cam member is larger than that of said diaphragm;

a cam follower means disposed in said cam chamber and having a cam follower being in contact with a cam surface of said cam member;

a spring holder disposed in said cam chamber;

a guide hole formed in a wall of said housing into which a guide portion of said spring holder is inserted and by which said spring holder is guided, so that the end of said

guide portion is in contact with said movable member; and,

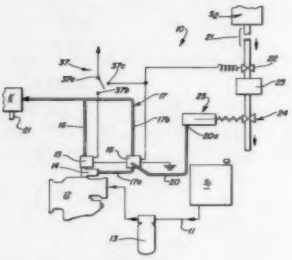
a third spring disposed in said cam chamber and between said cam follower means and said spring holder for urging said spring holder in a direction opposite to the biasing direction of said second spring, whereby when said cam member is rotated the urging force of said third spring becomes larger and thereby said preset load of said second spring is changed so as to change the predetermined value at which the pressure in said vacuum modulating chamber is controlled.

4,416,244

CONTROL SYSTEM FOR A DUAL FUEL INTERNAL COMBUSTION ENGINE

Ross W. McDonald, Bartholomew, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 24, 1981, Ser. No. 334,374
Int. Cl.³ F02B 7/02
U.S. Cl. 123—577 **11 Claims**



1. A control system for a dual fuel internal combustion engine, the latter having a first fuel source and a second fuel source under a predetermined pressure, said system comprising: primary means for metering fuel to the engine from the first fuel source as a function of engine load and operator demand; means for generating a control signal as a function of engine load; means for metering fuel from the second fuel source to the engine as a function of said control signal whenever it is desired to operate the engine in a dual fuel mode; and means responsive to operation of the engine in a dual fuel mode for modulating the fuel metered by said primary metering means by an amount which provides substantially the same fuel energy content delivered to the engine in the dual fuel mode as in the single fuel mode; said primary fuel metering means including a variable speed fuel pump, and a first feed line for connecting said pump to the engine, and said modulating means including means disposed in said first feed line for restricting flow a predetermined amount only when the engine is operating in the dual feed mode.

4,416,245

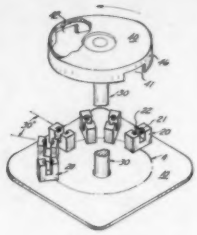
APPARATUS FOR DISTRIBUTING ELECTRICAL SIGNALS

Darwin O. Taft, Bainbridge, and Howard E. Van Siclen, Jr., Unadilla, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed May 26, 1982, Ser. No. 382,065
Int. Cl.³ F02P 1/00
U.S. Cl. 123—613 **2 Claims**

1. An apparatus for distributing electrical signals in a predetermined sequence within an engine ignition system, said apparatus of the type having a plurality of signal means for providing output signals within said engine ignition system, said signal means including a plurality of switches arranged in a circular pattern, each of said switches comprising a light emitting diode and a light detector adapted to supply an electrical signal in response to receipt of light from said diode; and means for blocking and allowing light to pass from said diode to said detector in a predetermined sequence, the improvement wherein said blocking and allowing means comprises:

a member that extends between the light emitting diode and light detector, said member having two windows therein



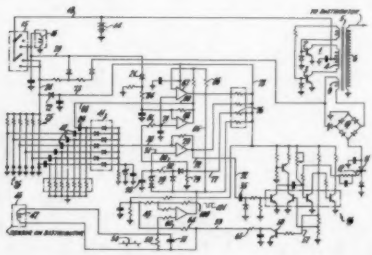
spaced 180 degress apart and adapted to be rotated as the crankshaft of the engine rotates, and wherein there are only as many switches as there are cylinders in the engine whereby for each revolution of said member said first and second windows allow two signals to pass between each diode and detector.

4,416,246

INTERNAL COMBUSTION ENGINE WITH FUEL INJECTION AND AC TYPE HIGH TENSION SPARK

Robert E. Canup, Poughkeepsie, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,322
Int. Cl.³ F02P 9/00
U.S. Cl. 123—618 **8 Claims**



1. In combination with an internal combustion engine having a crank shaft and employing fuel injection and including an AC type high tension electric spark to ignite a combustible mixture of said injected fuel,

a fuel injection valve having an electrically conductive material plunger in seating contact with an electrically conductive material body of said valve when closed,

said plunger being actuated by fuel pressure to open said valve,

first electrical circuit means for connecting a resistor in series with said plunger,

a comparator having two inputs and an output,

second circuit means for connecting a predetermined EMF to one of said comparator inputs,

third circuit means for connecting the other of said comparator inputs to said plunger,

said comparator output providing a signal to initiate said electric spark when said plunger is actuated by the fuel pressure, the improvement comprising

means for gating said comparator to permit said electric

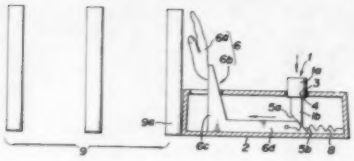
spark initiating signal only during a predetermined number of degrees of said crank shaft rotation.

4,416,247

DOMINO TOPPLING TOY

Takashi Yoshida, Tokyo, Japan, assignor to Yoshida Kogeisha, Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,396
Claims priority, application Japan, Dec. 31, 1979, 54-183018
Int. Cl.³ F41B *15/00*; A63B *71/00*
U.S. Cl. 124—79 **1 Claim**



1. A domino toppling toy for imparting a toppling force to a first domino piece of a domino train consisting of

a housing having a front, a back, a top and an opening in said top adjacent said front,

a moveable member accommodated in said housing and moveable between a first position adjacent said front and a second position adjacent said back, said moveable member having a head portion extending through said opening and above said housing, said head portion extending horizontally beyond said front when said moveable member is in said first position, and

operation means for operating said moveable member from said second position to said first position to exert said toppling force and automatically from said first position back to said second position upon removal of manual force on said means, said operation means consisting of

an operation member vertically, slideably mounted through said top of said housing and having a first tapered surface on an end in said housing.

a second tapered surface on an end of said moveable member opposite to said head portion, said second tapered surface engaging with said first tapered surface, and

a tension spring connected between said back of said housing and said end of said moveable member opposite to said head portion, said spring constantly urging said moveable member toward said second position.

4,416,248

ASH DISPOSAL DAMPER FOR BARBECUE KETTLE

Erich J. Schlosser, Lindenhurst, Ill., assignor to Weber-Stephen Products Co., Palatine, Ill.

Continuation-in-part of Ser. No. 222,125, Jan. 22, 1981, abandoned. This application Jul. 10, 1981, Ser. No. 282,261
Int. Cl.³ F24B *3/00*
U.S. Cl. 126—9 B **14 Claims**

1. In a kettle-type barbecue grill having a generally hemispheroidal bottom extending around a center vertical axis and having a plurality of air intake openings equally circumferentially-spaced around said bottom with damper means for covering said air intake openings, the improvement of said damper means including a post rotatable about said vertical axis and having a removable radial arm for each of said openings retained thereon and extending therefrom, said removable arms being maintained at a predetermined angular orientation on said post, said bottom having an aperture aligned with said vertical axis and said post being received into said aperture, and a handle secured to said post below said bottom, and releasably retained on said post to retain said post in said aperture, so that said arms can be telescoped on said post, and said

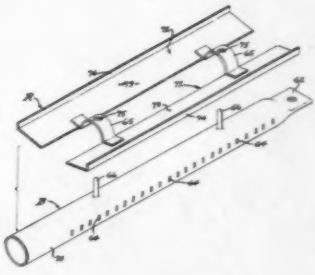
post can be inserted into said aperture and retained therein by said handle without the use of any tools.

4,416,249

OVEN BURNER RADIANT

Howard R. Reynolds, deceased, late of Los Angeles, Calif., and by Pauline N. Reynolds, executrix, 1131 East Wakeham Ave., Santa Ana, Calif. 92705

Continuation of Ser. No. 900,588, Apr. 27, 1978, abandoned, and a continuation-in-part of Ser. No. 749,316, Dec. 10, 1976, Pat. No. 4,144,870. This application Aug. 23, 1982, Ser. No. 410,534
Int. Cl.³ F24C *3/00*
U.S. Cl. 126—41 R **6 Claims**

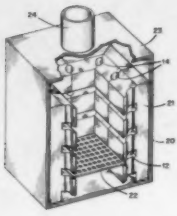


1. An improved radiant heat burner for gas stoves, and including; a burner tube receiving primary combustion air from a shutter control and with a row of jet openings at a horizontal median plane for directing laterally disposed flames with said primary combustion air from the side of said burner tube, and a flat imperforate radiant of substantially non-corrosive material positioned to the side of the burner tube by at least one yoke and juxtaposed horizontally above said row of jet openings and offset immediately above said median plane, there being an opening between the burner tube and the juxtaposed radiant admitting secondary combustion air from above the burner tube to enter beneath the radiant and over the flames for efficient combustion and intense heating of said radiant.

4,416,250
COMBUSTION APPARATUS AND REFRACTORY ELEMENTS FOR USE IN COMBUSTION APPARATUS

Stanley J. Kuzia, 610 Front St., Manchester, N.H. 03102

Filed Aug. 28, 1981, Ser. No. 297,432
Int. Cl.³ F23M 5/00
U.S. Cl. 126—146 8 Claims



1. A refractory casting configuration for use in lining firepots of stoves and furnaces comprising:

(a) an upright element of refractory material having an outside face, an inside face, a first side, a second side, a bottom end and a top end;

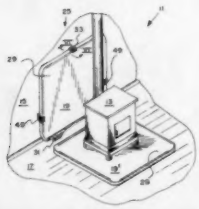
(b) at least one slot extending entirely across said inside face angling toward said top end as it extends toward said outside face;

(c) a recess in each of said first side and said second side extending from said bottom end to said top end and intersecting each of said at least one slot, whereby when a plurality of said elements are placed in side-by-side contact, said at least one slot in each element becomes continuous with said at least one slot in each of said plurality, and each of said recess mates with a corresponding recess in an adjacent block to form a vertical flue passage.

4,416,251
THERMOSHIELD

William H. Rachels, Sr., Memphis, Tenn., assignor to Rachels-Horton Industries, Inc., Memphis, Tenn.

Filed Oct. 30, 1981, Ser. No. 317,125
Int. Cl.³ F24C 15/36
U.S. Cl. 126—201 5 Claims

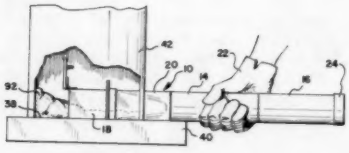


1. Thermoshield means intended for use in conjunction with a space heating appliance, said thermoshield means comprising a sub-assembly including a planar sheet of heat insulating material for providing an optimum heat barrier and a panel member formed from durable sheetmetal for providing support and a covering for at least one side of said sheet of heat insulating material and thusly establishing a durable obverse side for said sub-assembly, the marginal edges of said panel member being foldably doubled about the entire perimeter of said sheet of heat insulating material, thus encasing the obverse side and the marginal edges thereof, said panel member being fixedly crimped in place about the perimeter of the reverse side of said sub-assembly, support means for supporting said sub-assembly in an optimum up-right disposition between the space heating appliance and a wall situated adjacent thereto thus said sub-assembly provides a heat shield for the wall, continuous ridge means defining the circumjacency of said obverse side of said sub-assembly for providing an enhancement in the effectiveness of said support means; said support means including at least: (1) leg support means for engaging and thus supporting the lowermost portion of said sub-assembly a spaced distance above a floor surface thus allowing for free passage of air beneath said thermoshield means, and (2) solitary upper-offset bracket/wall attachment means for: (a) establishing and maintaining an optimum spaced distance between the uppermost portion of said sub-assembly and the wall which is being shielded therewith, and (b) providing a solitary means for attaching said sub-assembly to the wall; said leg support means includes leg attachable/detachable means for removably joining said leg support means to said sub-assembly, and said solitary upper-offset bracket/wall attachment means including solitary bracket attachable/detachable means for removably joining said solitary upper-offset bracket/wall attachment means to said sub-assembly, said leg attachable/detachable means as well as said solitary bracket attachable/detachable means are similiary characterized by peculiar-shaped self-engagable channellike means for interlockable engagement with said ridge means.

4,416,252
APPARATUS FOR REMOVING AND TRANSPORTING ASHES

Charles J. Blank, Jr., c/o 311 Wonderly Ave., Dayton, Ohio 45419

Filed Feb. 26, 1982, Ser. No. 352,625
Int. Cl.³ F23J 1/00; A01B 1/02; B65B 1/04
U.S. Cl. 126—242 11 Claims



1. An apparatus for removing and transporting ashes and the like from a hearth, comprising;

a scoop member having a hollow body, said body having a forward end defining an ash receiving opening, and a scoop lid mounted to said body to rotate outwardly therefrom for alternately covering and uncovering said opening;

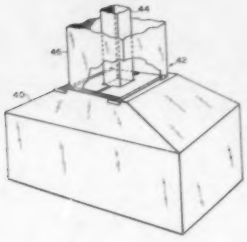
a container member defining an ash storage compartment and including a lid member defining a mouth shaped to receive said forward end and a flap mounted to said lid member to rotate into said compartment for alternately covering and uncovering said mouth; and

means attached to said scoop lid and said flap for linking said scoop lid to said flap such that insertion of said forward end into said mouth when said scoop lid and said flap are linked causes said scoop lid and said flap to rotate, thereby uncovering said opening and said mouth so that ashes contained within said body may pass to said storage compartment.

4,416,253
APPARATUS FOR CONTROLLING FLOW OF COMBUSTION PRODUCTS

John C. Ickes, 2017 S. Florida, Joplin, Mo. 64801

Division of Ser. No. 155,610, Jun. 2, 1980. This application Nov. 9, 1981, Ser. No. 319,809
Int. Cl.³ F23L 3/00
U.S. Cl. 126—292 7 Claims



1. A damper assembly for cooperation with an associated flue:

an inner flue extending along substantially the entire axial extent of the associated flue, said inner flue defining first and second parallel flow paths which are respectively inside of and outside of said inner flue;

means for modulating the flow through said second flow path;

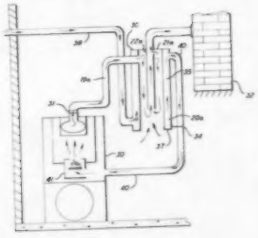
means for mounting said inner flue in generally coaxial relationship with the axis of the associated flue, said means for modulating comprises a pair of generally planar members; and

said generally planar members are each pivotally mounted.

4,416,254
FLUE STRUCTURE FOR DOMESTIC HEATING EQUIPMENT

Raymond B. DiPietro, 205 S. Central Ave., Minoa, N.Y. 13116

Continuation-in-part of Ser. No. 147,358, May 2, 1980, abandoned. This application Sep. 14, 1981, Ser. No. 301,981
Int. Cl.³ F23J 11/00
U.S. Cl. 126—307 A 2 Claims



1. For use in domestic heating equipment having a connection for attaching an external flue pipe thereto, improved external flue structure comprising a first flue pipe adapted to be connected at one end to the heating equipment connection, the other end of the first flue pipe being connected to the sidewall of a second flue pipe, the second flue pipe being vertically disposed and having a closed upper end and open lower end, the first flue pipe being connected to the second flue pipe sidewall a short distance below its closed upper end, a third flue pipe of smaller diameter than the second flue pipe and positioned in the latter in substantially concentric relation thereto, the upper end of the third flue pipe passing in sealed relation through the closed upper end of the second flue pipe and extending into communication with a chimney, the lower end of the third flue pipe being open and terminating a predetermined distance above the lower end of the second flue pipe whereby flue gases from the heating equipment pass into the second flue pipe and flow downwardly therein until they enter the lower end of the third flue pipe and pass upwardly therein to the chimney, a cylindrical jacket member concentric with and surrounding the second flue pipe, the jacket member being closed at its upper and lower ends whereby a closed annular chamber is formed between the second flue pipe and member, a first conduit means communicating with the lower end of the chamber for delivering outside air to the chamber, and a second conduit means connecting the upper end of the chamber to the heating equipment whereby preheated air for combustion is delivered to the latter.

4,416,255
WEDGE-SHAPED SOLAR AIR HEATING DEVICE

John J. Secamiglio, Roanoke, Va.; Edward T. Secamiglio, Philadelphia, Pa., and Anthony J. Secamiglio, Roanoke, Va., assignors to Sun Powered Inc., Roanoke, Va.

Filed Jun. 4, 1982, Ser. No. 385,083
Int. Cl.³ F24J 3/02
U.S. Cl. 126—422 14 Claims

1. A solar heating device adapted to be mounted against the exterior of a building and having rearwardly extending ducts for insertion into a building through an opening to the interior of the building, which comprises means defining a wedge-shaped casing having a heat pervious front wall inclined toward the building at an angle providing incidence to the sun and providing a wedge-shaped configuration with the tapered end being uppermost, two parallel essentially triangular side walls, bottom and top walls, and a rear wall, said casing having internally thereof a divider panel parallel and coextensive with the inclined front wall but for the lower end of the panel which terminates spacedly above the bottom, thus forming a passage from resultant front and rear chambers, said casing having first duct-forming means extending rearwardly from the upper portion of the rear wall and communicating with said rear chamber, and second duct-forming means extending rearwardly from the upper portion of the rear wall and communicating with said front chamber, said first and second duct-forming means constituting a casing support extension being located in relatively remote, elevated relationship to the lower portion of said casing rear wall, there being an air inlet at the end of said first duct-forming means remote from the communication thereof with said rear chamber, there being an air outlet in the portion of said second duct-forming means remote from the communication thereof with said front chamber, and heat transfer means disposed within said front chamber and comprising a heat-impervious rounded corrugated sheet overlying the forwardly-presented surface of the divider panel and having evenly-spaced longitudinal, alternating half round countours, and on the face of said corrugated sheet a superimposed heat impervious fine mesh metal screen, and said front

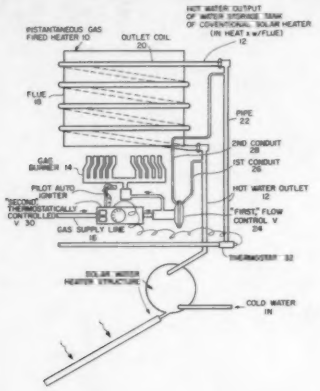
wall comprising a heat-pervious double-glazed pane with predetermined spacing between glazings, and wherein downwardly diverging baffles are disposed across the rear cool air chamber from back to front.

4,416,256

SOLAR WATER HEATERS

Ferdinand C. Korwill, Dalkeith, Australia, assignor to S. W. Hart & Co. Pty. Ltd., Welshpool, Australia

Filed Mar. 5, 1981, Ser. No. 240,672
Claims priority, application Australia, Mar. 6, 1980, PE2664
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—427 **5 Claims**


HOT WATER OUTPUT OF WATER STORAGE TANK OF CONVENTIONAL SOLAR HEATER (IN HEAT x w/FLUE)
INSTANTANEOUS GAS FIRED HEATER 10
OUTLET COIL 20
FLUE 18
PIPE 22
2ND CONDUIT 28
1ST CONDUIT 26
GAS BURNER 14
PILOT AUTO IGNITER
HOT WATER OUTLET 12
"SECOND" THERMOSTATICALLY CONTROLLED V 30
"FIRST" FLOW CONTROL V 24
GAS SUPPLY LINE 16
THERMOSTAT 32
SOLAR WATER HEATER STRUCTURE
COLD WATER IN

1. A solar water heater comprising

(a) a water storage tank having a cold water inlet pipe and a hot water outlet pipe;

(b) an instantaneous gas fired water heater operatively connected to said hot water outlet pipe and comprising a gas burner;

(c) a gas supply line to said gas burner;

(d) means for auto-igniting said gas burner;

(e) a flow control valve located in said gas supply line and arranged to allow gas to be fed to said gas fired water heater in response to water flow through said hot water outlet;

(f) a thermostatically controlled valve located in said gas supply line and arranged to allow gas to be fed to said gas fired water heater in response to the temperature of the water in said hot water outlet pipe; and

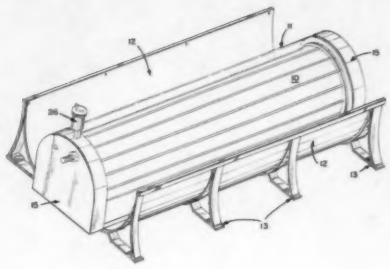
(g) a thermostat mounted in said hot water outlet pipe downstream of said gas fired water heater and arranged to cause said thermostatically controlled valve to open when the water in said hot water outlet pipe downstream of said gas fired water heater is at or below a predetermined minimum temperature and to cause said thermostatically controlled valve to close partially or completely so as to reduce or eliminate the amount of gas which can flow therethrough when the water in said hot water outlet reaches a predetermined maximum temperature, whereby gas flows to said gas fired water heater only when both said flow control valve and said thermostatically controlled valve are open.

4,416,257

SOLAR ENERGY COLLECTOR

Neville R. Bale, Cnr Avian & Killick Sts., Maroochydore, Qld., Australia

PCT No. PCT/AU80/00060, § 371 Date May 7, 1981, § 102(e) Date May 7, 1981, PCT Pub. No. WO81/00755, PCT Pub. Date Mar. 19, 1981
PCT Filed Sep. 7, 1980, Ser. No. 269,038
Claims priority, application Australia, Sep. 7, 1979, PE0387
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—427 **10 Claims**



1. A solar collector, comprising:

a longitudinal parabolic reflector;

a collector core assembly within said reflector and formed of a series of spaced tubes exposed to the direct rays of the sun and to rays reflected by said reflector;

said tubes being arranged in a cylindrical array and forming a fluid path between annular inlet and outlet manifolds;

a storage tank located within said array; and

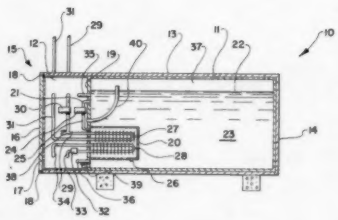
means for connecting said manifolds to opposite ends of said tank whereby said fluid is heated as it passes in said tubes from said inlet manifold to said outlet manifold to said tank.

4,416,258

HEAT STORAGE MEANS

Benjamin T. Gravely, 7001 Buckhead Dr., Raleigh, N.C. 27602

Continuation of Ser. No. 8,437, Feb. 1, 1979. This application Jul. 24, 1981, Ser. No. 287,094
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—428 **11 Claims**



1. A heat storage means comprising: an insulated enclosure; a tank portion and an equipment portion disposed interiorly of said enclosure; an insulated, readily removable closure forming part of said insulated enclosure adjacent said equipment portion whereby ready access into said equipment portion is provided; a passive means to maintain substantial thermal equilibrium between said tank portion and said equipment portion in the form of a liquid impervious, heat conductive interface means separating such tank portion from such equipment portion; an immersion air vent extending through said interface

into the upper portion of said tank portion to provide pressure equilibrium without loss of tank fluid through evaporation; and equipment means mounted within said equipment portion, at least a part of which is functionally designed to penetrate said tank portion through said interface and at least a part of which gives off heat during operation, said equipment, among other things, controlling heat transfer within said tank portion whereby a compact heat storage means is provided with substantial thermal equilibrium being maintained between said tank portion and said equipment portion.

4,416,259

METHOD AND ARRANGEMENT FOR HEAT CONDITIONING OF BUILDINGS

Lars Skogström, and Bengt Bergqvist, both of Stockholm, Sweden, assignors to Aeromator Trading Company AB, Stockholm, Sweden

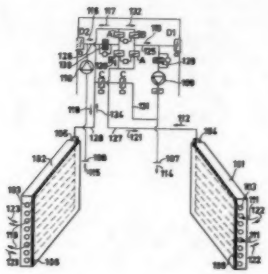
PCT No. PCT/SE80/00102, § 371 Date Dec. 11, 1980, § 102(e) Date Dec. 5, 1980, PCT Pub. No. WO80/02190, PCT Pub. Date Oct. 16, 1980

PCT Filed Apr. 10, 1980, Ser. No. 224,542

Claims priority, application Sweden, Apr. 11, 1979, 7903251; Mar. 3, 1980, 8001647

Int. Cl.³ F24J 3/02

U.S. Cl. 126—429 **17 Claims**



1. Method for air conditioning a region in a building where the building utilizes construction elements of concrete or the like having channels therein through which air is passed between the outside environment and said region, comprising passing air from said region through the channels of said elements from said region to the outside environment for a first predetermined period of time to thereby transfer the temperature condition of the air leaving the region to said construction elements, reversing the flow by passing said air from the outside environment through said channels to said region for a second predetermined period of time to thereby transfer the temperature condition of the construction elements to said air entering said region, alternating said flows for said first and second periods of time regularly substantially continuously, and regulating said flows and said first and second periods of time to control the temperature in said region and to simultaneously balance the air pressure in said region, so that said construction elements function as regenerative heat exchangers.

7. An arrangement for air conditioning a region within a building where the building utilizes construction elements of concrete or the like having channels wherein through which air is passed comprising, a first group of channels in said construction elements, means to connect said first group of channels to the outside environment, a second group of channels at a different location in said construction elements, second means to connect said second group of channels to the outside environment, at least one exhaust duct for said region adapted to be alternately communicated with said first group of channels and said second group of channels, at least one inlet duct for said region adapted to be alternately communicated with said first group of channels and said second group of channels, pump means to force said air through said ducts and channels, and valve means operably connected to said exhaust and inlet ducts and to said first and second groups of channels to connect said exhaust duct alternately with said first and second groups of channels while simultaneously connecting said inlet duct alternately with said second and first group of channels to control the flow of air reversibly through said first and second groups of channels between said ducts and the outside environment.

4,416,260

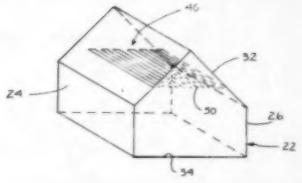
SOLAR HEATING SYSTEM FOR GREENHOUSES AND THE LIKE

Budd L. Proctor, Manchester, Mo., assignor to PSI Energy Systems, Inc., Fenton, Mo.

Filed Oct. 13, 1981, Ser. No. 310,898

Int. Cl.³ F24J 3/02

U.S. Cl. 126—429 **7 Claims**



1. A solar heating system for greenhouses and the like having a translucent roof, said system comprising a black plastic sheet spaced below an upper portion of said translucent roof and extending transversely under the roof in spaced relation thereto to define with the roof a substantially enclosed plenum to provide a solar collection space for hot air generated therein by solar energy, said black plastic sheet forming a floor of the roof plenum and a ceiling for a greenhouse space to be heated below, a solar integral self-contained heat storage chamber supported upon a floor of the greenhouse, air directing means supported within a housing connected to and supported upon said chamber for selectively directing;

(a) hot air from said roof plenum to said solar heat storage chamber in a charge cycle,

(b) hot air from said roof plenum to a greenhouse space to be heated in a direct heat cycle and,

(c) hot air from said solar heat storage chamber to a greenhouse space to be heated in a discharge cycle, the solar heat storage chamber being provided with means for directing hot air therefrom to a hot air manifold to direct hot air to selected floor areas of the greenhouse to provide heat thereto, said manifold being comprised of a laterally extending conduit supported above the floor of the greenhouse and communicating with a plurality of longitudinally extending flexible heat distribution conduits extending along and supported by the floor of the greenhouse, said flexible conduits being moveable to said selected areas to provide variable heat thereto as desired.

4,416,261

SOLAR COLLECTOR COMPRISING AN ABSORBER PLATE WHICH EXCHANGES HEAT WITH THE EVAPORATOR SECTION OF A HEAT PIPE

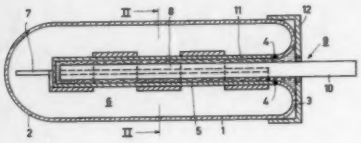
Herman H. M. van der Aa, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,248

Claims priority, application Netherlands, Dec. 11, 1980, 8006716

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—433 **2 Claims**



1. A solar collector, which comprises a metal heat pipe having an evaporator section and a condenser section; a metal tube spaced from and surrounding the evaporator section, one end of said metal tube being closed and the other end being open; a metal solar heat absorber plate thermally conductively connected to the metal tube; an evacuated transparent glass envelope spaced from and surrounding the metal tube and the absorber plate connected thereto, said envelope being joined to the open end of the metal tube by means of a glass-metal seal; a thermally conductive liquid medium filling the space between the metal tube and the evaporator section of the heat pipe; and a seal between the heat pipe and the envelope.

4,416,262

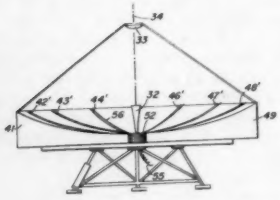
HIGH RATIO MICROWAVE ENERGY CONCENTRATING COLLECTOR

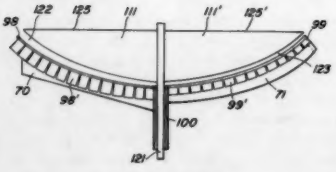
William P. Niedermeyer, 1024 Mt. Mary Dr., Green Bay, Wis. 54301

Continuation-in-part of Ser. No. 171,097, Jul. 22, 1980, Pat. No. 4,340,031. This application Dec. 10, 1981, Ser. No. 329,389

Int. Cl.³ F24J *3/02;* **G02B** *5/08*

U.S. Cl. 126—438 **30 Claims**





1. A concentrating microwave energy collector comprising:

a disc reflector having a surface which is a paraboloid of revolution;

an energy absorbing means along the axis of revolution and arranged for energy transfer to a conductor operatively connected thereto;

said disc reflector including a plurality of fixed radially extending supports, each having a top inclined surface, and also having side planar surfaces disposed parallel to said axis;

a plurality of flexible members mounted above said supports and having tab portions in vertical planar contact with the side surfaces of said supports and being vertically slideably adjustable relative thereto; said supports and flexible members being operatively adjustable in parabolic relationship relative to the axis of revolution; said tabs being affixed to said supports after said adjustment;

and a microwave energy reflective surface installed on top of said flexible members.

29. The method of constructing a paraboloid of revolution for microwave energy collection, including the steps of:

arranging a plurality of reflector surface supports having a first upper surface in radial arrangement about the axis of a paraboloid and having planar surfaces parallel to and coincident with said axis;

mounting a plurality of flexible members above said first surface of said supports with vertical portions in contact with planar vertical surfaces of said supports;

urging said flexible members upwardly against a fixed template which has a parabolic shaped bottom edge;

fixing said flexible members to said supports;

covering said flexible members with a sheetlike member which conforms to the contours of the flexible members;

supporting a microwave energy receiver along the axis of the paraboloid above the sheetlike member;

connecting said receiver to a conductor.

4,416,263

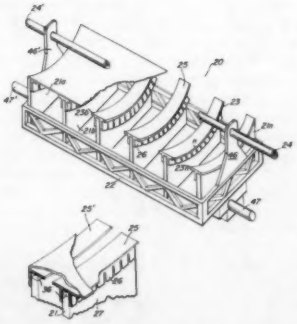
HIGH RATIO SOLAR ENERGY LINEAR TYPE CONCENTRATING COLLECTOR

William P. Niedermeyer, 1024 Mt. Mary Dr., Green Bay, Wis. 54301

Continuation-in-part of Ser. No. 329,389, Dec. 10, 1981, which is a continuation of Ser. No. 171,097, Jul. 22, 1980, Pat. No. 4,340,031. This application Jan. 18, 1982, Ser. No. 340,065

Int. Cl.³ F24J *3/02;* **G02B** *5/08*

U.S. Cl. 126—438 **24 Claims**



1. A solar energy linear type concentrating collector including:

a heat collector;

a parabolic reflector arranged to collect, concentrate, and direct solar rays toward the heat collector,

heat transfer fluid in contact with said collector at a distance from said reflector,

said heat collector being conductive and coated with absorptive means for improving heat transfer to said heat transfer fluid and arranged co-incident with the focal line of the parabolic reflector,

a plurality of spaced supports arranged transversely of the axis of the collector;

each of said supports having a top surface and also having major side planar surfaces transverse to said axis;

a flexible member mounted above each of said supports and having tabs in vertical planar contact with the major side surface of said supports, and being vertically slidably adjustable relative thereto;

said supports and flexible members being adjustable in coacting parabolic relationship;

said tabs being ultimately fixed to said supports to prevent relative movement therebetween;

said parabolic reflector being in continuous contact with, and supported by, top surfaces of said flexible members;

whereby the spaced support and flexible member combination provides intermittent load bearing surfaces for the said reflector.

23. The method of constructing a linear parabolic solar energy collector, including the steps of:

arranging a plurality of reflective surface supports with major planar sides perpendicular to the axis of the collector, said supports having an inclined upper surface;

mounting a flexible member above said inclined upper surface of said supports, said flexible member having vertically downwardly extending tabs in contact with said major planar sides of said supports;

urging said flexible members upwardly against a template having a parabolic shaped bottom edge;

fixing said flexible member to said supports;

mounting a reflective surface above said flexible members;

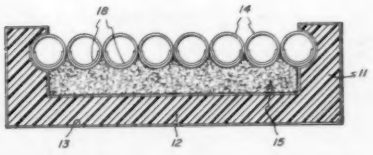
mounting a heat transfer fluid conduit at the focal line of the parabolic reflective surface so that said reflector-collector structure acts in correlated operation with said absorptively coated fluid conduit.

4,416,264

SOLAR HEAT COLLECTOR

Carlyle S. Herrick, and Richard S. Alben, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 29, 1980, Ser. No. 201,811
Int. Cl.³ F24J 3/02
U.S. Cl. 126—442 **3 Claims**



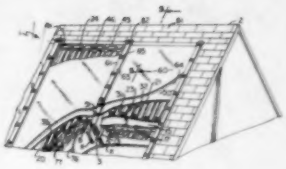
1. A solar energy collector structure comprising: a housing enclosing a flow volume having heat insulative sides of structural foam, a plurality of partially evacuated tubular members substantially transparent to incident solar radiation mounted on the top of said housing, an absorber of filamentary material contained within said housing, said fibers being positioned to intercept the radiation transmitted through the evacuated tubular member cover, and a heat resistant transparent elastomer positioned between each tubular member to chemically bond said tubes and provide a substantially planar, self-supporting, weather tight tubular cover.

4,416,265

SOLAR COLLECTOR

John G. Wallace, Box 55a, Rte. 1, Mound City, Kans. 66056

Filed Dec. 16, 1981, Ser. No. 331,187
Int. Cl.³ F24J 3/02
U.S. Cl. 126—446 **2 Claims**



1. In combination with a structure having elongated, substantially parallel framing members each having a side face, an inner edge and an outer edge, a solar collector comprising:

(a) a pair of base panel support members each attached to a respective framing member side face in spaced relation from and substantially parallel to a respective framing member outer edge;

(b) a base panel having an outer surface and connected to said base panel support members, said base panel extending between an opposed pair of said framing member side faces;

(c) a plurality of juxtaposed extruded metal collector plates positioned on said base panel outer surface, each of said collector plates comprising:

(1) an inlet end;

(2) an outlet end;

(3) a web having opposite side margins; and

(4) a fluid conduit terminating at and open at said inlet and said outlet ends;

(d) said adjacent pair of framing members each having a first and a second elongated slot, each of said elongated slots opening onto a respective framing member outer edge;

(e) an inlet header positioned in said first slots for relative movement with respect to said framing members, said inlet header being attached to said collector plate inlet ends and communicating fluid with said fluid conduits;

(f) an outlet header positioned in said second elongated slots and movable therein relative to said framing members, said outlet header being connected to said collector plate outlet ends and communicating fluid with said fluid conduits;

(g) a plurality of mechanical fasteners each positioned at a respective web side margin for loosely retaining said collector plates against said base panel outer surface, each of said mechanical fasteners comprising:

(1) a head positioned outwardly of a respective web; and

(2) a shank fixedly embedded in said base panel adjacent a respective web side margin;

(h) a transparent cover attached to and extending between said framing member outer edges;

(i) a ceiling panel attached to and extending between said framing member inner edges; and

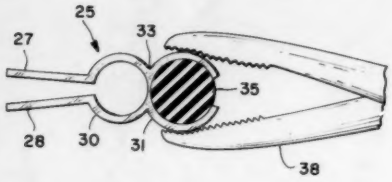
(j) a layer of thermally insulating material positioned between said base panel and said ceiling panel.

4,416,266

MEDICAL CLIP

Robert M. Baucom, Carrollton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 15, 1981, Ser. No. 264,381
Int. Cl.[3] A61B 17/12
U.S. Cl. 128—325 3 Claims



1. A medical clip for use in treating aneurisms and the like in a living animal and having the inherent physical property characteristic of being essentially transparent to X-rays, comprising:

a unitary structure terminating at one end with a pair of elongated jaws having essentially flat abutting surfaces and the other end with a broken circular segment;

an intermediate segment integrally disposed between said elongated jaws and said broken circular end and formed of a pair of semicircular portions extending from said elongated jaws;

a connection area between the said pair of semicircular portions and said broken circular segment and disposed substantially 180° relative to said elongated jaws;

means provided on said connection area serving as a hinge connection for said unitary structure so as to permit opening and closing of said pair of elongated jaws;

said hinge connection joining said broken circular segment and said intermediate segment to form a pair of "hourglass" cavities;

a silicone rubber insert being disposed within the cavity formed by said broken circle segment to serve as a spring force to pivotally contract said elongated jaws against each other through said hinge connection; and

said unitary structure being formed of a molded composite material having the inherent physical property characteristic of being biologically inert, transparent to X-rays and capable of withstanding conventional sterilization procedures.

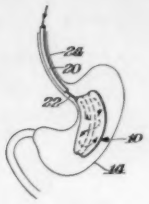
4,416,267

METHOD AND APPARATUS FOR TREATING OBESITY

Lloyd R. Garren, and Mary L. Garren, both of P.O. Box 3738, Wilmington, Del. 19807

Filed Dec. 10, 1981, Ser. No. 329,182
Int. Cl.[3] A61B 17/00
U.S. Cl. 128—1 R 7 Claims

1. A stomach insert for treating obesity in humans by reducing the stomach volume comprising a flexible, free-floating and unattached, inflatable balloon having a central opening extending therethrough, the balloon being inflatable to a volume of a person being treated, at least a portion of the balloon having a self-sealing substance to facilitate puncture thereof with insufflation means through which the balloon is inflated and to



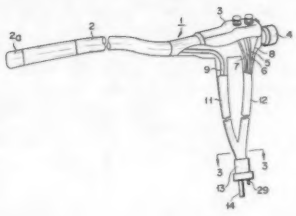
facilitate sealing of the puncture upon removal of the insufflation means.

4,416,268

ENDOSCOPE HAVING TWO DETACHABLE ARMOUR TUBES

Tadao Hagino, Yokohama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1981, Ser. No. 278,096
Claims priority, application Japan, Jul. 10, 1980, 55-94190; Sep. 30, 1980, 55-136127
Int. Cl.[3] A61B 1/06
U.S. Cl. 128—6 6 Claims



1. An endoscope coupled with a light source unit, comprising:

an endoscope body including a control section and an insert section;

a first armour tube having one end connected with said control section;

a light source;

a light guide extending from said light source and through said endoscope body, alone and only through said first armour tube;

a second armour tube having one end connected with said control section and separated from said first armour tube up to about the distal end portions of each said tube;

an elongated insert means extending from said endoscope body and said second armour tube and terminating at the distal end thereof to be inserted into a body cavity;

first coupling means connecting the ends of said first and second armour tubes to said control section for coupling said light guide and said insert means to the light source unit; and

a second removable coupling means for connecting said first and second armour tubes to a light source and sources of water, air, and suction, said coupling means including a hole formed therein through which the said first armour tube is inserted, an engaging pin having a tip extendable into the through hole, a spring urging the engaging pin into the through hole, and a recess formed in the face of the first armour tube adapted to engage the tip of the

engaging pin to firmly position the first armour tube with respect to said coupling means.

4,416,269

APPARATUS FOR VIBRATING THE ULNA IN VIVO

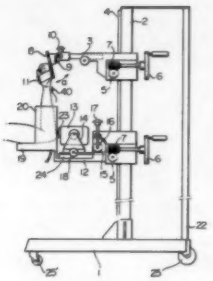
Shogo Enomoto, Tokorozawa; Masanobu Sawai, Yamato; Iwao Seo, and Tomonobu Yamaguchi, both of Ami, all of Japan, assignors to Teikoku Hormone Mfg. Co. Ltd. and Mitsubishi Petrochemical Co., Ltd., both of Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,045

Claims priority, application Japan, Jul. 11, 1980, 55-93826

Int. Cl.³ A61M *1/00*

U.S. Cl. 128—41 **8 Claims**



1. An apparatus for vibrating an ulna in vivo, comprising:

a base stand;

a main post provided upright on said base stand;

a horizontally extending upper arm secured to an upper part of said main post for vertical movement;

a plate means for fixing the back of a hand, said plate means being secured to an end of said upper arm for free movement at an arbitrary angle of inclination with respect to said upper arm, and having a band member which holds said hand onto said plate means so as to bring said back of said hand into closest possible contact with a surface of said plate means and to lift an antebrachium and maintain it suspended in the air;

a lower arm means secured for vertical movement to a lower part of said main post and extending in the same horizontal direction as said upper arm;

an excitor means mounted on the lower arm for sliding movement in the axial direction of said lower arm and in a horizontal direction perpendicular thereto, said excitor having a movable head which projects horizontally so as to abut against an olecranon in the axial direction of said lower arm; and

a brachium resting plate fixed ahead of said excitor;

wherein said ulna is vibrated by the excitor while its ends are kept free.

4,416,270

PERCUSSOR

Harold R. Havstad, Eagle Point, Oreg., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Continuation of Ser. No. 50,685, Jun. 21, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,468

Int. Cl.³ A61H *7/00*

U.S. Cl. 128—53 **8 Claims**

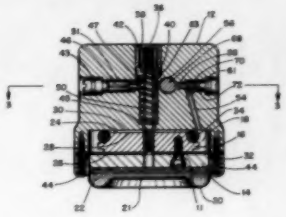
1. A percussor comprising

an oscillating assembly comprising a reciprocating plate and an applicator cooperating therewith for directing reciprocating motion from said plate to a user,

a rigid housing member having therein first and second gas chambers, and first gas sealing means between said gas chambers,

second gas sealing means cooperating with said reciprocating plate to prevent gas leakage from said first chamber through said oscillating assembly,

gas inlet means for introducing gas into said first gas chamber at a pressure therein sufficient to overcome said first gas sealing means whereby gas enters said second gas chamber and causes movement of said oscillating assembly in a first direction of said reciprocating motion,



gas outlet means for venting gas from said second gas chamber whereby pressure therein is reduced causing movement of said oscillating assembly in a second direction of said reciprocating motion, and

biasing means urging said first gas sealing member to form a gas seal between said first and second gas chambers.

4,416,271

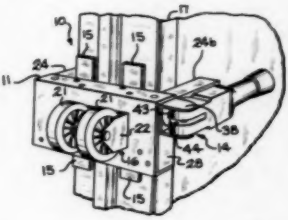
SPINAL MISALIGNMENT DETECTIVE AND CORRECTIVE APPARATUS

Kern E. Chester, 104 Academy Dr., Paragould, Ark. 72450

Filed Oct. 16, 1981, Ser. No. 312,164

Int. Cl.³ A61H *15/00*

U.S. Cl. 128—57 **12 Claims**



12. A spinal misalignment and corrective apparatus for mounting on a vertically-extending door jamb member and comprising, a base member, a pair of wheels extending outwardly from said base member and mounted for rotation on a horizontal axis, support means operatively connected to said base in opposed relationship to said pair of wheels for removably holding said apparatus to such vertically-extending door jamb member, said support means including a pair of outwardly-extending rectangular tube members pivotally mounted on said base member, the distal ends of said tube members being moveable toward one another to engage such vertically-extending door jamb member, resilient stop means on said base member for engaging and protecting such vertically-extending door jamb member, and clamping means operatively connected to said tube members, said clamping means including linkage means having one end connected to one of said tube members, said linkage means extending through the other of said tube members and operatively connected to a handle assembly, said handle assembly including a cam and handle means, whereby movement of said handle means urges the distal ends of said tube members to engage such vertically-extending door jamb member, said linkage means including

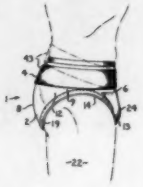
adjusting means for adjusting the initial spacing between said tube members.

4,416,272

COMBINATION UNDERPANT AND HERNIAL TRUSS

Nedwyn R. Nelkin, Overland Park, Kans., assignor to H. G. Enterprises, Kansas City, Mo.

Filed Apr. 24, 1981, Ser. No. 257,236
Int. Cl.[3] A61F 5/24
U.S. Cl. 128—96 7 Claims



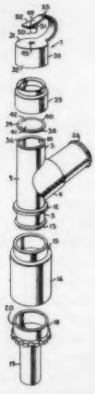
1. A combination underpant and hernial truss comprising:
(a) an underpant brief having front, rear and crotch portions and spaced legholes separated by said crotch portion;
(b) said front portion having a truss pad connected thereto and protruding inwardly of said brief to engage and support an abdominal hernial area of the body of a wearer;
(c) a belt and a means for adjusting the tension of said belt, said belt encircling said brief and being secured to said front portion near a lateral center thereof and substantially adjacent said pad for directing hernia retaining force thereon; said belt being free from securement to said rear portion so as to allow selective movement upwardly and downwardly relative to said rear portion to adjust to the wearer's comfort.

4,416,273

CONNECTOR VALVE ASSEMBLY FOR ENDOTRACHEAL TUBES

Jerry L. Grimes, 1798 N. Garey Ave., Pomona, Calif. 91767

Filed Jun. 15, 1981, Ser. No. 273,662
Int. Cl.[3] A61M 16/00
U.S. Cl. 128—207.16 2 Claims



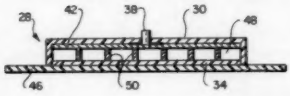
1. A connector valve assembly for admission of catheters through endotracheal tubes comprising:
(a) a connector body having a tracheal tube port, a respiratory tube port and an open end portion for insertion of a catheter through said body and said tracheal tube;
(b) a valve means at said open end portion including a ring seal portion for sealably engaging said catheter and a check valve disposed inwardly of said ring seal portion toward said respiratory tube port and said tracheal tube port;
(c) wall means defining an air lock chamber between said ring seal portion and said check valve for insertion of a catheter without opening said connector body to the outside atmosphere;
(d) said wall means includes an end wall with said ring seal portion extending therethrough and a surrounding side wall having a lower skirt portion sized to fit over said open end portion;
(e) said open end portion having a shoulder; said skirt portion having an inwardly directed flange providing an inner shoulder to confront said shoulder; and
(f) a disc member having a peripheral edge captured between said shoulder and said inwardly directed flange and having portions providing a valve seat wherein said check valve has a flapper attached to said disc member and sealably engaging said valve seat.

4,416,274

ION MOBILITY LIMITING IONTOPHORETIC BIOELECTRODE

Stephen C. Jacobsen, Salt Lake City, and Richard D. Luntz, Murray, both of Utah, assignors to Motion Control, Inc., Salt Lake City, Utah

Filed Feb. 23, 1981, Ser. No. 236,753
Int. Cl.[3] A61M 15/08
U.S. Cl. 604—20 13 Claims



1. A bioelectrode for use in the iontophoretic delivery of ions into the skin or tissue of a person comprising
means holding ions to be delivered, one side of which is for placement against the person's skin or tissue, said holding means being adapted to inhibit movement of ions in a direction generally parallel to the surface of the skin or tissue,
an electrically conductive sheet of material disposed at a substantial portion of the other side of said holding means, and
means for coupling said sheet of material to an electrical source.

4,416,275

APPARATUS FOR APPLYING A URINE RECEPTACLE TO A MALE

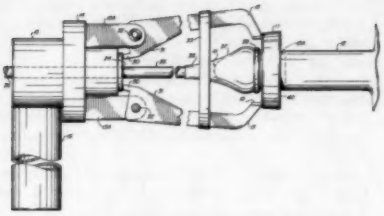
Herbert A. Omley, P.O. Box L-2, Wickenburg, Ariz. 85358

Filed Dec. 21, 1981, Ser. No. 332,938
Int. Cl.[3] A61B 17/00
U.S. Cl. 128—303 A 11 Claims

1. An apparatus for applying an elastic ring to a shaft of a penis for use in attaching a urine receptacle thereto comprising:
a housing means, an elastic ring having slots on a end surface,
a plurality of cooperating jaw means pivotally mounted on said housing for movement generally radially relative to each other piston means,
each jaw means having an outwardly directed finger means at the end of the jaw remote from its pivotal connection for engaging slots in said end surface of the said elastic ring,
a first means mounted on said jaw means for biasing said jaw

means radially inwardly to a predetermined position relative to each other so that the fingers on said jaws can penetrate the slots,

a second means mounted within said housing for spreading the jaws radially outwardly against the biasing action of said first means after gripping the associated ring to expand the ring to a predetermined diameter, and



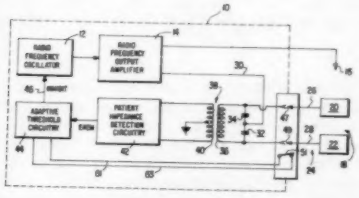
an opening means extending through said housing means axially aligned with the longitudinal axis of the ring for receiving therethrough in a direction extending outwardly of said finger means a tool means for holding the glans penis while the expanded ring is placed thereover and while the jaw means are sequentially biased toward each other to position the ring firmly around the shaft of the penis.

4,416,276

ADAPTIVE, RETURN ELECTRODE MONITORING SYSTEM

David W. Newton, Boulder, and William G. Paterson, Longmont, both of Colo., assignors to Valleylab, Inc., Boulder, Colo.

Filed Oct. 26, 1981, Ser. No. 315,053
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.13 **26 Claims**



1. A return electrode monitoring system for use with a split patient return electrode having two, electrically isolated electrode elements adapted for contacting a patient, said system comprising

means responsive to the impedance between said two electrode elements for producing a signal which is a function of said impedance;

means for establishing a desired range having an upper limit and a lower limit for said impedance when the patient is in contact with the electrode elements;

determining means responsive to said signal for determining whether said impedance is within said desired range; and

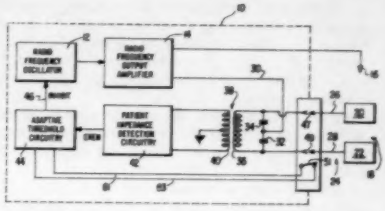
adjusting means for automatically adjusting said upper limit to adapt said system to the particular impedance of said patient in response to said particular impedance occurring within the desired range.

4,416,277

RETURN ELECTRODE MONITORING SYSTEM FOR USE DURING ELECTROSURGICAL ACTIVATION

David W. Newton, Boulder; Frederic M. Hulett, III, Longmont, both of Colo., and Christopher Ovens, San Antonio, Tex., assignors to Valleylab, Inc., Boulder, Colo.

Filed Nov. 3, 1981, Ser. No. 317,780
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.13 **17 Claims**



1. A return electrode monitoring system for use with a patient return electrode adapted for contacting a patient, said return electrode having two, spaced apart conductors attached thereto for connecting the electrode to a generator of electrosurgical current which passes through the electrode, said system comprising

means for applying a monitoring current through said conductors to said electrode;

detecting means responsive to said monitoring current for producing a signal which is a function of the impedance between said two conductors, said detecting means including means including a synchronous detector for substantially eliminating any effect the electrosurgical current might have on the production of said signal when said electrosurgical and monitoring currents are simultaneously applied to said return electrode;

means for establishing a desired range having at least an upper limit for said impedance; and

determining means responsive to said signal for determining whether said impedance is within said desired range

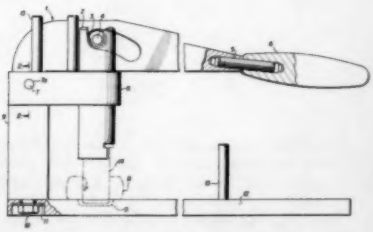
whereby said monitoring system is susceptible to negligible interference from the electrosurgical current when monitoring is continued during application of the electrosurgical current to the patient.

4,416,278

BONE PLUG CUTTER

Joseph E. Miller, 641 Argyle Ave., Westmont, Quebec, 3C1

Continuation of Ser. No. 61,067, Jul. 26, 1979, abandoned. This application May 18, 1981, Ser. No. 265,075
Int. Cl.³ A61B *17/32*
U.S. Cl. 128—305 **5 Claims**



1. A bone plug cutter for cutting a bone plug from a portion of the bone comprising:

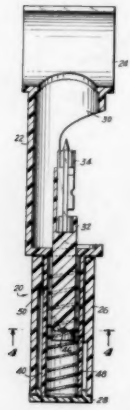
(a) a base for retaining a portion of the bone in a given position;
(b) a vertical support having first and second ends, the first end of the support connected to the base;
(c) a longitudinal member having a first end, a second end and a central portion interconnecting the first and second ends of the longitudinal member, the first end of the longitudinal member is hinged to the second end of the vertical support, a die support is hinged to and supported by the central portion of the longitudinal member and has an aperture therein for receiving an interchangeable die, said die support containing a die for cutting the bone plug, whereby downward pressure on the second end causes the die support and die to move toward the base so that the bone plug may be cut from the portion of the bone located between the base and the die;
(d) stop means for stopping the movement of the second end of the longitudinal member and of the die toward the base after the bone plug is cut, to prevent damage to the die; and
(e) a guide connected to said vertical support, said guide having an aperture therein for receiving the die support and guiding the die support in a substantially vertical direction as the longitudinal member is rotated about the vertical support whereby said guide provides said stop means; and
(f) wherein a hollow dish-shaped opening is provided within the base and below the die so that when the longitudinal member is stopped by said stop means, the cutting end of the die rests within said opening and does not come into contact with the base.

4,416,279

CAPILLARY BLOOD SAMPLING DEVICE

James A. Lindner, 4316 168th St., Flushing, N.Y. 11358, and Roger E. Desroches, 93-10 112th St., Richmond Hill, N.Y. 11418

Filed Jun. 19, 1981, Ser. No. 275,218
Int. Cl.³ A61B *17/32*
U.S. Cl. 128—314 **13 Claims**



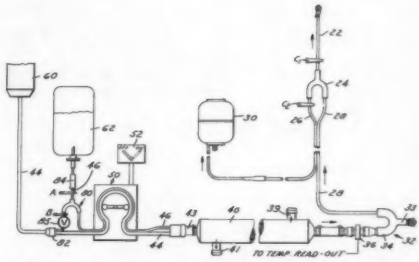
1. An improved capillary blood sampling device comprising:
(a) a longitudinal hollow tubular body having an access opening in the side to receive a lancet and open opposite ends;
(b) a finger position area defined at one of said open ends of said longitudinal body;
(c) a rotational operating member rotationally connected at the other of said open ends of said longitudinal body;
(d) a lancet holder positioned concentrically within said longitudinal body and said rotational operating member and adapted to be moved between a loading position and a released position;
(e) spring means within said rotational operating member coupled to said lancet holder and adapted to be compressed by said lancet holder when said lancet holder is moved away from said finger position area toward said loading position;
(f) said rotational operating member having spring operation means adapted to move said lancet holder toward said loading position to compress said spring means in response to rotation thereof and also adapted to release said lancet holder for movement toward said released position in response to further rotation thereof;
(g) whereby said lancet holder is responsive to rotation of said rotational operating member to move away from said finger position area and compress said spring means to permit loading of a lancet in said lancet holder and responsive to
(h) further rotation of said rotational operating member to release said lancet holder to be propelled toward said finger position area by said spring means.

4,416,280

CARDIOPLEGIA DELIVERY SYSTEM

Walter L. Carpenter, Grass Lake, and Bruce A. Amrine, Ann Arbor, both of Mich., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 137,716, Apr. 7, 1980, abandoned. This application Dec. 10, 1981, Ser. No. 329,604
Int. Cl.³ A61M *1/03*
U.S. Cl. 128—399 **3 Claims**



1. A method of obtaining cardioplegia, thereby facilitating open heart surgery, wherein the patient's blood is passed by an external pump through an extracorporeal system and then returned to the patient, the extracorporeal system including devices which temporarily perform the function of the heart and lungs, said method comprising the steps of:
(a) diverting a proportioned, predetermined flow of the patient's blood from the extracorporeal system into an accessible blood path;
(b) providing a supply of cardioplegia medication and a medication path into the blood path;
(c) selectively introducing a proportioned predetermined flow of the cardioplegic medication from the supply through the medication path and into the blood path;
(d) mixing the blood and the cardioplegic medication;
(e) passing said mixture of blood and medication through a heat exchanger to cool said mixture to a predetermined temperature;
(f) directing the cooled mixture of blood and medication, selectively, into the heart of the patient to obtain the desired cardioplegic cooling of the patient's heart by the proportioned and diverted flow of the patient's blood with the cardioplegic medication mixed therein;
(g) selectively stopping said introduction of a predetermined flow of cardioplegic medication from the medication

supply and selectively introducing blood from said blood path into said medication path thereby purging the medication from said medication path; and

(h) selectively stopping the flow of blood and/or medication to the patient's heart and directing the flow of blood and/or medication to a reservoir.

4,416,281

SURGICAL CUSHION FOR COOLING AN ORGAN

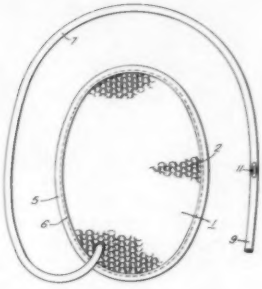
Albert A. Cooper, Abbott's Langley, England; Mohamed El-Rayes, Tripoli, Libya, and Alan K. Yates, Warlingham, England, assignors to Guardline Disposables Limited, Hertfordshire, England

Filed May 26, 1981, Ser. No. 267,428

Claims priority, application United Kingdom, Mar. 5, 1981, 8106908

Int. Cl.³ A61F *7/00*

U.S. Cl. 128—400 **8 Claims**



1. A surgical cushion comprising a layer of flexible, open-form knitted plastics filament mesh, a further layer of flexible material secure with the first-mentioned layer, a flexible tube, a proximal end portion of said flexible tube which is secure with and extends between said two layers, and at least one hole-defining part of said tube defining a hole of the tube at a position between said layers, whereby cooling fluid in regions within and near to the cushion when it is in use may be drawn off.

4,416,282

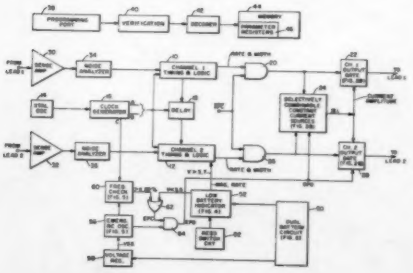
CARDIAC PACER WITH IMPROVED, OUTPUT CIRCUITRY

Stanley H. Saulson, and Peter P. Tarjan, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Mar. 2, 1981, Ser. No. 239,468

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **4 Claims**



1. An implantable externally programmable tissue stimulator having output means for producing electrical stimulation pulses on command on a lead, a plurality of parameter registers for storing selected externally programmable parameter values including rate and pulse intensity, stimulating logic means for causing said output means to produce a stimulation pulse in accordance with a stored rate value and means in said output means for determining the pulse intensity in accordance with the stored intensity value, wherein the improvement comprises

register means among said parameter registers for storing a single selected numerical value indicative of a corresponding one of a known set of preestablished uniquely paired combinations of differing pulse duration and amplitude for the electrical stimulation pulses, and

means in said output means responsive to said selected value and said stimulating logic means for forming an output stimulation pulse with a duration and amplitude corresponding to the paired combination indicated by said selected value stored in said register means.

4,416,283

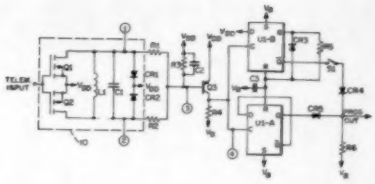
PROGRAMMING AND TELEMETRY SYSTEM FOR BIOMEDICAL IMPLANTABLE DEVICE

Chester D. Slocum, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Aug. 31, 1981, Ser. No. 297,746

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **17 Claims**



1. In a programming system for a biomedical implant of the type wherein an external programmer produces a series of magnetic impulses which are received and transduced to form a corresponding electrical pulse input to programmable parameter data registers inside the implant, wherein the improvement comprises

external programming pulse receiving and transducing circuitry in the implant including

a tuned coil,

means responsive to pairs of successive voltage spikes of opposite polarity magnetically induced across said tuned coil by said magnetic impulses for forming corresponding binary pulses duplicating said externally generated magnetic impulses giving rise to said spikes, and

means for outputting said binary pulses to said data registers to accomplish programming of the implant.

4,416,284

TWO PIECE BRASSIERE AND METHOD OF USE

Stanton F. Fink, IV, 324 Codifer Blvd., Apt. 4, Metairie, La. 70005

Filed Sep. 2, 1980, Ser. No. 183,476

Int. Cl.³ A41C *3/00*

U.S. Cl. 128—425 **2 Claims**

1. A two piece brassierre comprising:

(a) a plurality of three cornered breast cup means of various sizes and shapes for individually fitting each of a pair of breasts, that may be dissimilar in size and shape, with equally well-fitted breast-cup means in which two adjacent corners of each of said cup means are horizontally aligned below respective breasts and a third corner thereabove; and

(b) a plurality of strap means, one fitted to each corner of each of said breast cup means, two of said strap means

extending oppositely in horizontally alignment for extending around the lower chest just below said breasts, and the third of said strap means extending upwardly over the adjacent shoulder, said strap means of each said cup means

being secured to the others by the free ends thereof, and independently of the strap means of the other breast cup means, for independently supporting each breast in its natural position, shape and size.

4,416,285

IMPROVED OPTICAL CATHETER AND METHOD FOR MAKING SAME

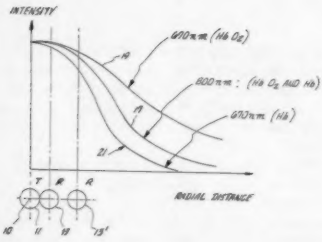
Robert F. Shaw, Portola Valley, and John Sperinde, San Jose, both of Calif., assignors to Oximetrix, Inc., Mountain View, Calif.

Continuation of Ser. No. 964,612, Nov. 29, 1978, Pat. No. 4,295,470, which is a continuation of Ser. No. 733,279, Oct. 18, 1976, abandoned. This application Aug. 13, 1981, Ser. No. 292,696

The portion of the term of this patent subsequent to Oct. 20, 1998, has been disclaimed.

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—634 **6 Claims**



1. A population of catheters suitable for use during photometric analysis of a fluid, each member of said population of catheters having a single transmitting optical fiber having proximal and distal ends with aperture means respectively formed therein for conducting radiant energy therethrough, each member of said population of catheters also having a single receiving optical fiber having proximal and distal ends with aperture means respectively formed therein for conducting radiant energy therethrough, at least some of said transmitting and receiving fibers within said population of catheters differing sufficiently in a cross-sectional dimension from one another such that calibration of individual members of said population of catheters would otherwise be necessary to carry out accurate photometric analysis of the fluid even if said transmitting and receiving optical fibers of said members were used in parallel and tangent configuration at said distal ends, said aperture means being located at said distal ends of said transmitting and receiving optical fibers in each member of said population of catheters so that said fibers respectively have centroids of area spaced from one another at a fixed distance which is identical for all members of said population of catheters such that the need for individual calibration of each member of said population of catheters is eliminated despite differences in the dimensions of said transmitting and receiving optical fibers.

4,416,286

ULTRASONIC BLOOD FLOW MEASURING APPARATUS

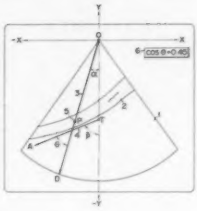
Kazuhiro Iinuma, Yaita; Yasutsugu Seo, Otawara, and Shigeru Sato, Chigasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 6, 1981, Ser. No. 232,235

Claims priority, application Japan, Feb. 12, 1980, 55-15811

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—663 **9 Claims**



1. An ultrasonic blood flow measuring apparatus comprising:

transducer means for transmitting an ultrasonic beam into an object, receiving an ultrasonic echo reflected from the object, and converting such echo into an electrical signal;

scanning means for scanning the object with said ultrasonic beam;

first detecting means for detecting a tomogram signal of the object from said electrical signal;

display means for displaying said tomogram of the object corresponding to said tomogram signal;

second detecting means for extracting a Doppler signal from said electrical signal;

marker generating means responsive to operator control for selectively locating on said display means and superimposed over said tomogram both a first marker indicative of a selected first direction in which said ultrasonic beam travels when passing through a selected portion of a vessel in the object in which the blood flow is to be measured, and a second marker which is indicative of a second direction in which blood flows through said portion of said vessel; and

calculating means responsive to the location of said first and second markers on said display means for calculating an angle θ defined by said first and second directions and for calculating the velocity of the blood flow through said portion of said vessel based on said Doppler signal and said angle θ.

4,416,287

DISCHARGE VALVE FOR A BLOOD PRESSURE MEASURING DEVICE OR THE LIKE

Karlheinz Riester, Jungingen, Fed. Rep. of Germany, assignor to Rudolf Riester GmbH & Co., KG, Jungingen, Fed. Rep. of Germany

PCT No. PCT/EP81/00010, § 371 Date Sep. 28, 1981, § 102(e) Date Sep. 28, 1981, PCT Pub. No. WO81/02096, PCT Pub. Date Aug. 6, 1981

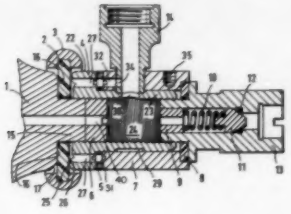
PCT Filed Jan. 27, 1981, Ser. No. 308,540

Int. Cl.³ A61B *5/02*; F61K *25/00*

U.S. Cl. 128—685 **7 Claims**

1. In a discharge valve for a blood pressure measuring device or the like, including a valve casing having a central bore therethrough which is in fluid communication with an inflatable cuff, a pressure measuring device and an air outlet, with

said air outlet leading to an outlet valve seat located on the exterior of the valve casing, the improvement wherein said valve seat is circular, comprising an elastic annular valve washer concentrically disposed with respect to said circular valve seat and engaging said seat on one side thereof, a stud-shaped guide member on which said valve washer is mounted, a ring-shaped control element mounted on the outer edge of said valve washer for deflecting said washer from the valve seat, a flat, annular support surface engaging the other side of



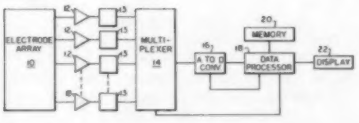
said valve washer having an outer diameter at least approximately equal to that of said circular valve seat along which the valve washer presses against the valve casing on the side of said washer which faces the air outlet, a conical ring-shaped surface extending radially outward from the outer diameter of said support surface at an angle of about 45° away from the valve washer, the air outlet having a smaller diameter than said circular valve seat, and the valve washer having a larger outer diameter than said support surface.

4,416,288

APPARATUS AND METHOD FOR RECONSTRUCTING SUBSURFACE ELECTROPHYSIOLOGICAL PATTERNS

Walter J. Freeman, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 14, 1980, Ser. No. 178,170
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—731 **14 Claims**



1. An apparatus for recovering a pattern of cell generated electrical field potential U occurring at a specific time t and at a selected depth within a living organ from an associated pattern of electrical potential V at said specific time and at the surface of said living organ, said cell generated electrical field potential U having coordinates x', y' and being describable as $U=U(x', y', y', t)$, said electrical potential V having coordinates x, y and being describable as $V=V(x, y, t)$, said apparatus comprising:

an electrode array for detecting values of V(x, y, t) at a plurality of points on the surface of said living organ, said points being spaced from each other by a distance determined by the expected spatial frequency of said electrical potential V(x, y, t);

means for digitizing the detected values of V(x, y, t); and

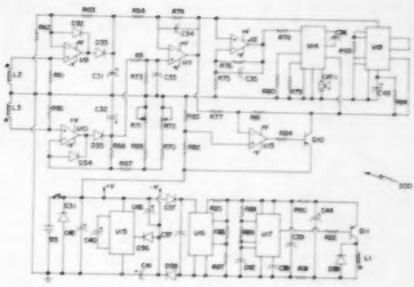
means for spatially deconvolving the digitized values of V(x, y, t) to recover the desired pattern of electrical field potential U(x', y', t) within said living organ, said deconvolving means including computing a transform function $f_z=f_z(x-x', y-y')$, said transform function having the value determined by an equation which describes the field potential at each of a plurality of subsurface points with respect to the field potential of each of a plurality of other selected sets of subsurface electric field potential generators, such that the potential at any one point is the sum of potentials from such surrounding generator sets, with each potential having a value determined by the laws of conduction in the volume of said organ, and means for computing the product of said surface field potential V(x, y, t) and the inverse of said transform function to generate values of the electric field potential U(x', y', t).

4,416,289

CIRCUITS FOR DETERMINING VERY ACCURATELY THE POSITION OF A DEVICE INSIDE BIOLOGICAL TISSUE

Robert G. Bresler, Watertown, Mass., assignor to McCormick Laboratories, Inc., Acton, Mass.

Continuation-in-part of Ser. No. 261,521, May 7, 1981. This application Apr. 26, 1982, Ser. No. 371,078
Int. Cl.³ A61B *5/05, 5/06*
U.S. Cl. 128—737 **14 Claims**



1. A circuit for determining very accurately the position of a device in biological tissue, comprising:

a detector means,

said detector means having a field coil which, when activated, generates a field, said detector means also having a first receiving coil and a second receiving coil which are both disposed in the field generated by said field coil,

said first receiving coil producing a first a.c. output signal and said second receiving coil producing a second a.c. output signal when the field is generated, and

an alarm means,

said alarm means having a first rectifier means and a first integrator means, said first rectifier means receiving the first a.c. output signal and converting it to a first d.c. signal and said first integrator means converting the first d.c. signal to a first d.c. averaged signal,

said alarm means also having a second rectifier means and a second integrator means, said second rectifier means being an active rectifier having an amplifier means and a means for adjusting the output of said amplifier means, said second rectifier means receiving the second a.c. output signal and converting it to a second d.c. signal, the amplitude of which may be varied by said means for adjusting, and said second integrator means converting the second d.c. signal to a second d.c. averaged signal, the amplitude of the second d.c. averaged signal being adjusted by said means for adjusting to be identical with the first d.c. averaged signal when the device is not detected,

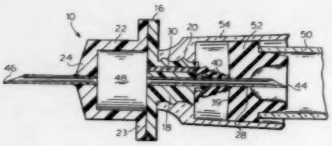
said alarm means further including an alarm amplifier means which receives the first and second d.c. average signals and produces an alarm output corresponding to any difference between them, as would be caused by the presence of the device inside the field, whereby the alarm output is used to activate an alarm.

4,416,290

MULTIPLE SAMPLE NEEDLE ASSEMBLY WITH VEIN INDICATION

Lawrence Lutkowski, East Rutherford, N.J., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed Aug. 30, 1982, Ser. No. 412,647
Int. Cl.³ A61B 5/14
U.S. Cl. 128—764 **8 Claims**



1. A needle assembly for collecting one or more liquid samples from a source for subsequent discharge sequentially into a plurality of evacuated containers, comprising

(a) a housing defining a sample collection chamber therein;
(b) a front wall on said housing;
(c) a rear wall on said housing;
(d) an intravenous point spaced from said front wall;
(e) a negative pressure point spaced from said rear wall;
(f) cannula means extending from said intravenous point to said negative pressure point;
(g) means in said cannula means for communicating the lumen of said cannula means with said sample collection chamber;
(h) a resilient sleeve extending over the portion of said cannula means extending from said back wall to said negative pressure point;
(i) a flange on said sleeve on the end thereof adjacent said rear wall;
(j) a passage containing a gas permeable, liquid impermeable filter extending from said chamber through said rear wall; and
(k) a flat surface on said sleeve flange for cooperating with said rear wall for blocking gas from passing through said filter;
(l) whereby when said intravenous point engages said source, liquid enters said chamber through said communicating means by forcing gas in said chamber through said filter, and when said negative pressure point comes in contact with an evacuated container the stopper thereof causes collapse of said sleeve, moving said sleeve flange against said rear wall for cooperating blockage of said passage.

4,416,291

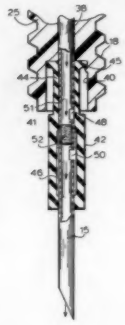
MULTIPLE SAMPLE NEEDLE ASSEMBLY WITH VEIN ENTRY INDICATOR

Joseph Kaufman, Emerson, N.J., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed Jul. 20, 1981, Ser. No. 284,894
Int. Cl.³ A61B 5/14
U.S. Cl. 128—766 **13 Claims**

1. A multiple sample needle assembly for determining vein entry when collecting blood samples from a patient comprising:

a housing have a forward end, a rearward end and a chamber within, said housing being translucent at least around the chamber so that said chamber is viewable by a user of said assembly;
a first cannula in fluid communication with said chamber extending outwardly from said forward end adapted for insertion into a patient;
a second cannula in fluid communication with said chamber extending outwardly from said rearward end adapted for penetration of an evacuated container for collection of a blood sample;
a pair of spaced holes through the side of the outwardly extending portion of the second cannula, said holes communicating with the lumen of said second cannula;
an air-permeable, blood impermeable porous plug positioned in the lumen of said second cannula in the space between said holes;
a resilient, slidable valve on the exterior of said second



cannula; said resilient slidable valve being slidable on said second cannula from a first position covering at least one of said pair of holes for preventing blood from flowing out of said second cannula to a second position allowing blood to flow out of said one hole; and
means in said resilient slidable valve for allowing blood to flow out of said one hole and back into said second cannula through the other of said pair of holes whereby blood is collected from said second cannula, into a container attached thereto.

4,416,292

METHOD AND APPARATUS FOR DETERMINING THE NEUTRAL AXIS OF A FOOT OR THE LIKE

Dennis N. Brown, 1091 Fir Ave., Blaine, Wash. 98230

Filed Aug. 19, 1981, Ser. No. 294,307
Int. Cl.³ A61B 5/10
U.S. Cl. 128—779 **12 Claims**

8. A level for finding the neutral axis of a foot comprising in combination:

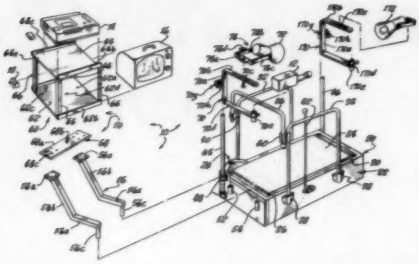
a level including a centering indicator,
adhesive means on said level remote from said indicator for temporarily affixing said level to a person,
and adjustable orientation means interposed between said level and said adhesive means to alter the angular relationship between said adhesive means and said level whereby said level can be moved once said adhesive means has been affixed to the person to initialize said level.

4,416,293

METHOD AND APPARATUS FOR RECORDING GAIT ANALYSIS IN PODIATRIC DIAGNOSIS AND TREATMENT

Blair V. Anderson, 1695 Lakeside Dr., Reno, Nev. 89509; Morris Feldman, 528 "B" St., Santa Rosa, Calif. 95403, and Richard Jacoby, Phoenix, Ariz. 85001

Filed Mar. 19, 1981, Ser. No. 245,319
Int. Cl.³ A61B 5/10
U.S. Cl. 128—782 8 Claims



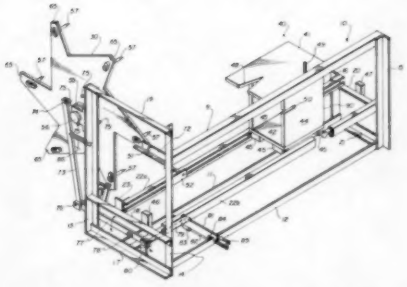
1. A method for recording gait analysis for diagnosis and treatment of podiatric conditions comprising; (1) having a subject whose gait is being analyzed move on a treadmill which is controllable by an operator; (2) Simultaneously recording and displaying a view of the patient's activity under the controlled conditions; (3) recording the diagnosis session by sound recording; (4) altering the conditions of activity of the subject by alteration of the treadmill characteristics; (5) recording by video and sound the effects of the altered treadmill conditions; and (6) analyzing the results comparatively.

4,416,294

LEAF STRIPPER

Raymond L. Turpin, 146 W. Chrystal St., Dover, N.J. 07801, and William K. Medford, RD 1 Box 306, Clyde, N.C. 28721

Filed Aug. 24, 1982, Ser. No. 411,014
Int. Cl.³ A01P 45/16; B26D 1/00
U.S. Cl. 130—30 R 10 Claims



1. A device for stripping burly tobacco or the like from its associated stalk comprising, in combination:

a frame,

a wheel rotatably carried on said frame having means for retaining a plurality of stalks thereon,

stripping means carried on said frame oriented to run the length of the stalk, removing tobacco therefrom,

advancing means for moving successive tobacco stalks in registry with said stripping means,

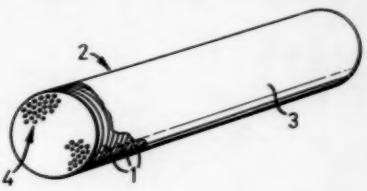
and indexing means for stopping said advancing means when a successive stalk is in position to be stripped.

4,416,295

SMOKING-MATERIAL RODS AND A METHOD OF MAKING SUCH RODS

Colin C. Greig, Salisbury, and Richard G. Hook, Winchester, both of England, assignors to Union Camp Corporation, Wayne, N.J.

Filed Oct. 7, 1981, Ser. No. 309,489
Claims priority, application United Kingdom, Oct. 17, 1980, 8033543
Int. Cl.³ A24F 1/00; A24D 1/00, 1/18
U.S. Cl. 131—364 16 Claims



1. A rod of smoking material, for use as at least part of a smoking article, which is formed by a multiplicity of laminiform self-sustaining smoking-material elements extending transversely of the rod and located in face-to-face contact with one another, wherein the elements are provided with smoke passages therethrough.

4,416,296

COMPOSITION AND METHOD FOR HAIR TREATMENT

William E. Meyers, Helena, Ala., assignor to Carson Products Company, Savannah, Ga.

Filed Nov. 17, 1980, Ser. No. 207,437
Int. Cl.³ A45D 7/00
U.S. Cl. 132—7 12 Claims

1. A composition for treating hair when applied thereto, comprising a non-aqueous solution of guanidine hydroxide and from 0.5% to 25% by weight of said solution of an inert organic solvent for said guanidine hydroxide, the user adding a preselected amount of water to said solution before applying said composition to the hair, said composition having a pH greater than 11.8.

4,416,297

HAIR WAVING OR STRAIGHTENING PROCESS AND PRODUCT

Leszek J. Wolfram, Stamford; David Cohen, Milford, and Norman N. Tehrani, Stamford, all of Conn., assignors to Clairol Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 114,479, Jan. 23, 1980, abandoned. This application Aug. 13, 1981, Ser. No. 292,452
Int. Cl.³ A45D 7/04
U.S. Cl. 132—7 25 Claims

1. In a process for waving or straightening hair, which comprises the sequential steps of:

(a) moistening the hair with an aqueous solution;

(b) winding strands of the hair over curling rods;

(c) contacting the hair with a composition which contains a reducing agent;

(d) rinsing the hair;

(e) contacting the rinsed hair with a composition which contains a neutralizing agent;

the improvement which comprises:

(i) said composition employed in step (a) containing at least one cationic polymer product which forms a substantially water insoluble complex with an anionic surfactant in the presence of hair; and

(ii) said composition employed in step (c) containing at least one anionic surfactant.

4,416,298

ELECTRICAL IGNITION SYSTEM FOR CATALYTICALLY HEATED CURLING DEVICE

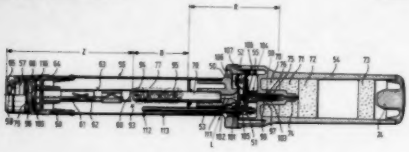
Conrad Berghammer, Kronberg; Walter Schäfer, Frankfurt am Main, and Rolf Stühler, Wiesbaden-Delkenheim, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Mar. 9, 1982, Ser. No. 356,566

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1981, 3109353

Int. Cl.³ A45D *2/12*

U.S. Cl. 132—33 R **4 Claims**



1. In a curling device having a tubular body defining a combustion chamber therein, and having first and second ends and a hair winding portion disposed between the first and second ends and surrounding the combustion chamber, heating means including a catalyst means disposed in the combustion chamber, a housing member proximate the tubular body including fuel supply means for storing a fuel in a liquid state, and aspirating means coupled between the fuel supply means and the combustion chamber for vaporizing the fuel and for mixing the vaporized fuel with air and for supplying a vaporized fuel/air mixture to said catalyst means, self-contained electrical ignition means mounted in the first end of the tubular body proximate the catalyst means for initiating oxidation of the vaporized fuel/air mixture in the presence of the catalyst means, the improvement comprising:

a battery chamber, including a battery, mounted in said electrical ignition means;

an air chamber disposed between said battery chamber and said combustion chamber for inhibiting heat flow between said battery chamber and said combustion chamber, said air chamber being substantially sealed from both said battery chamber and said combustion chamber and having an opening only to ambient air outside said tubular body;

an accessable button member located in the tip of said first end of said tubular body;

an incandescent filament, proximate said catalyst means, for oxidizing the vaporized fuel/air mixture in the presence of said catalyst means; and

conductive means providing an electrical connection between said battery and said incandescent filament, when said button member is pressed, thereby electrically activating said incandescent filament.

4,416,299

COIN LOADER

Charles T. Bergman, Watertown, Wis., assignor to Brandt, Inc., Watertown, Wis.

Filed Aug. 13, 1981, Ser. No. 292,653

Int. Cl.³ G07D *9/00*

U.S. Cl. 133—1 R **4 Claims**

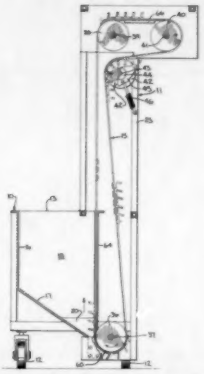
1. A coin loader, comprising:

a bin having an open top and including interior walls which slope toward a low area adjacent the bottom of a vertical wall of the bin;

a support framework mounted to the bin and rising therefrom at said vertical wall;

a flexible conveyor belt extending about rollers supported on said framework, said conveyor belt having a vertical run disposed in said vertical wall and extending upwardly therefrom and a horizontal run extending from the top of the vertical run to a discharge point laterally of said bin; said conveyor belt being imperforate to the smallest coins to be handled;

a plurality of flights spaced along said belt and each including a ledge portion which projects away from the surface



of said belt a distance greater than one-half the largest diameter of coins to be handled and which terminates in a lateral edge formed from a series of curves;

a comb disposed at said low area of said bin and having surfaces which are spaced from and complement the lateral edge of the flights and through which the flights pass at the bottom of said vertical run; and

a motor connected to rotate at least one of said rollers.

4,416,300

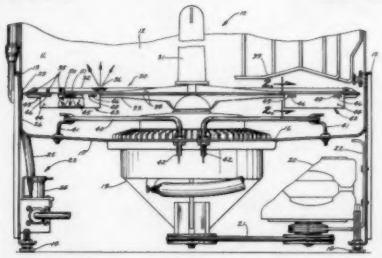
HEAT SHIELDED THERMOPLASTIC WASH ARM FOR DISHWASHER

Lawrence J. Jordan, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Sep. 25, 1981, Ser. No. 305,620

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—108 **10 Claims**



1. An article washing apparatus having a washing chamber and a liquid pumping system associated with the bottom wall thereof, the combination comprising: a rotatable horizontally elongated thermoplastic wash arm associated with said liquid pumping system and operable for effecting the washing of said articles by spraying liquid thereon; means for heating spaced upwardly from said bottom wall generally subjacent said elongated thermoplastic wash arm and energizable for heating said washing chamber; and means rotatable with said thermoplastic wash arm disposed between said means for heating and said

thermoplastic wash arm and including heat shield means mounted on said thermoplastic wash arm to effectively shield said thermoplastic wash arm from heat radiated by said heating element.

4,416,301

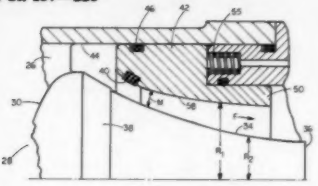
ANNULAR PISTON VALVE

Richard S. Brumm, Orinda, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Jun. 22, 1981, Ser. No. 275,924

Int. Cl.³ F16K *15/02*

U.S. Cl. 137—220 **6 Claims**



1. A valve body having a generally cylindrical inner surface;

a rigid piston seat ring slidable in and along said inner surface;

a streamlined flow diverter of varying circular cross-section fixed in said valve body coaxially with said inner surface and having a rounded upstream surface increasing to a maximum diameter and a tapered surface downstream thereof;

a narrow band machined around said tapered surface immediately downstream of said maximum diameter forming a seating surface; and

a resilient main seal ring carried on the leading portion of said seat ring engageable with said seating surface;

an internal shoulder in and around said valve body downstream of said seating surface forming a reduced diameter interior surface downstream therefrom;

an external shoulder on and around said piston seat ring facing said internal shoulder; and

means biasing between said shoulders to urge said piston seat ring into sealing engagement with said seating surface;

the outer surface of said flow diverter and the inner surface of said piston seat ring being contoured so that, when said seat ring is retracted to withdraw said main seal ring from said seating surface, the flow area between said piston seat ring and said flow diverter diminishes to a location slightly downstream of said main seal ring and then does not thereafter diminish over said tapered surface.

4,416,302

SELECTIVELY FOLDABLE SIDE INLET BALLCOCK

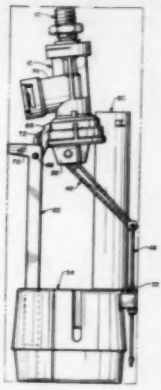
Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631

Division of Ser. No. 220,812, Dec. 29, 1980, Pat. No. 4,338,964. This application Nov. 18, 1981, Ser. No. 322,401

Int. Cl.³ F16K *43/00, 33/00*

U.S. Cl. 137—315 **7 Claims**

1. In a side inlet ballcock of the type having a generally horizontally extending water inlet tube secured to a generally horizontally extending valve housing enclosing a valve, a water outlet tube normally connected horizontally intermediate said valve housing extending generally vertically downwardly therefrom, a float guide connected adjacent and end of said valve housing opposite said water inlet tube normally extending vertically downwardly of said valve housing, a valve control arm vertically pivotally connected to said valve housing end projecting generally horizontally therefrom, a float normally vertically slideable on said float guide, and a float connector pivotally connected to said valve control arm and normally extending generally vertically downwardly connected to said float; the improvements including: pivot means operably connecting an upper end portion of said float guide selectively pivotal in a generally vertical plane outwardly in a direction away from said valve housing end and to a folded position approaching generally parallel to said water inlet tube and valve housing horizontal extension, said float moving slideably along and with said float guide to said folded position, said float connector pivoting relative to said valve control arm and moving with said float and float guide to said folded



position; attachment means selectively removably connecting an upper end portion of said water outlet tube to said valve housing; whereby, said ballcock may be shipped with said water outlet tube removed and said float guide, float and float connector assembled but in said folded position, and may be assembled for use merely by selective attachment of said water outlet tube and pivoting said float guide to its normal vertically downwardly extending position carrying said float and float connector therewith.

4,416,303

MOTOR VEHICLE FUEL TANK

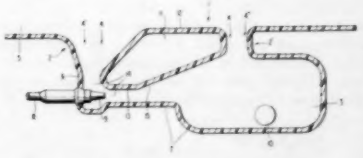
Dieter Scheurenbrand, Ostfildern, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 20, 1981, Ser. No. 236,507

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1980, 3006254

Int. Cl.³ E03B *11/00*

U.S. Cl. 137—576 **10 Claims**



9. A plastic fuel tank for motor vehicles, the fuel tank includes a surge tank disposed exteriorly of an interior space of the fuel tank, means for separating the surge tank from the fuel tank, and fuel return means, characterized in that a first means is provided for communicating the surge tank with the interior space of the fuel tank, a second means separate from the first means, is provided for communicating the interior space of the fuel tank with the surge tank, and in that the fuel return means and said second communicating means form an injector means for injecting fuel into the surge tank, the fuel return means

includes a discharge nozzle adapted to discharge returned fuel into the second communicating means.

4,416,304

FULLY COMPENSATED FLUID CONTROL VALVE

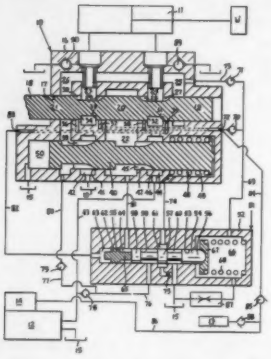
Tadeusz Budzich, Moreland Hills, Ohio, assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 247,887, Mar. 26, 1981, Pat. No. 4,362,087. This application Sep. 21, 1982, Ser. No. 420,699

The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.

Int. Cl.³ F15B *13/02*

U.S. Cl. 137—596.13 **10 Claims**



1. A valve assembly supplied with pressure fluid by a pump, said valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, and fluid exhaust means connected to reservoir means, first valve means for selectively interconnecting said load chambers with said fluid supply chamber and said fluid exhaust means, first variable metering orifice means responsive to movement of said first valve means and operable to meter fluid flow between said fluid supply chamber and said load chambers, second variable metering orifice means responsive to movement of said first valve means and operable to meter fluid flow between said load chambers and said fluid exhaust means, positive load fluid throttling means between said fluid inlet chamber and said fluid supply chamber, control means of said positive load fluid throttling means having pilot amplifying valve means, said pilot amplifying valve means having control force generating means responsive to pressure differential across said first variable metering orifice means, said pilot amplifying valve means operable through control of said positive load fluid throttling means to maintain a relatively constant pressure differential across said first variable metering orifice means and means responsive to negative load pressure in said load chambers having closing means operable to deactivate in closed position said positive load throttling means through said pilot amplifying valve means.

4,416,305

VALVED COUPLING FOR CONDUITS

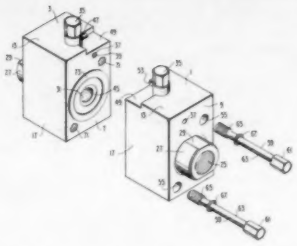
Denis S. Commette, Mantoloking, and Carl W. Sundberg, Jr., Shrewsbury, both of N.J., assignors to Gusmer Corporation, Lakewood, N.J.

Filed Dec. 22, 1981, Ser. No. 333,267

Int. Cl.³ F16L *37/28*

U.S. Cl. 137—614 **5 Claims**

1. A coupling for conduits comprising a pair of blocks having opposed flat faces, means for detachably securing the blocks together with their opposed flat faces in sealed relationship with each other, a passageway through each block perpendicular to the opposed flat faces for the passage of liquid, a ball valve disposed in each passageway for opening and closing the passageway, each ball valve having a spherical outer surface which, in the closed position of the valves, is disposed in said passageway closely adjacent the plane of the associated said flat face, said spherical surface of each said ball valve lying entirely on one side of the associated said plane, and an annular beveled surface coaxial with each said passageway and opening through the associated said opposed flat face, each said



annular beveled surface being conical and lying on a cone whose apex is disposed a substantial distance from the centroid of the spherical outer surface of the associated said ball valve on the same side of said centroid as said beveled surface, each said annular beveled surface terminating in circular edges disposed in two spaced parallel planes, a portion of said spherical outer surface of said ball valve being disposed between said spaced parallel planes in the closed position of th valves.

4,416,306

METHOD AND APPARATUS FOR CONTROLLING ARTICULATED FLUID LOADING ARMS UPON EMERGENCY DISCONNECTION

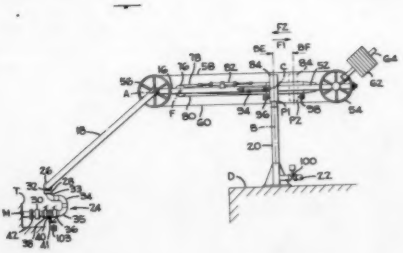
Eugene R. Le Devehat, Sens, France, assignor to FMC Corporation, Chicago, Ill.

Filed Aug. 3, 1981, Ser. No. 289,739

Claims priority, application France, Aug. 4, 1980, 80 17184

Int. Cl.³ B63B *35/44*

U.S. Cl. 137—615 **17 Claims**



1. An articulated loading arm for transferring fluid from one fluid handling means to another and for controlling movement of the outer end of the loading arm during emergency disconnection thereof from an adjacent fluid handling means, said arm comprising:

an inner arm member;

means mounting said inner arm member for pivotal movement about a first horizontal axis;

an outer arm member pivotally connected at one of its ends to the outer end of said inner arm member for movement about a second horizontal axis;

a first counterweight supported by said inner arm member and coupled to said outer arm member to counterbalance said loading arm about said first horizontal axis and said outer arm member about said second horizontal axis;

an auxiliary counterweight movably supported by said inner arm member for adjusting the entire loading arm about said first horizontal axis between a substantially balanced condition with the arm empty and a substantially balanced condition with the arm filled with fluid; and

means for moving the auxiliary counterweight between positions wherein said substantially balanced conditions are achieved.

4,416,307

VALVE ASSEMBLY

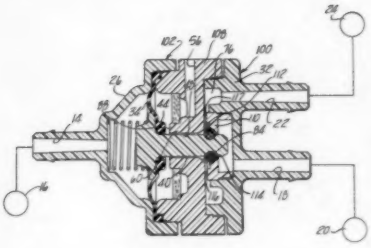
Charles A. Detweiler, Durand, Mich., assignor to Schmelzer Corporation, Flint, Mich.

Division of Ser. No. 107,278, Dec. 26, 1979, Pat. No. 4,327,773. This application Nov. 12, 1981, Ser. No. 320,469

The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.

Int. Cl.³ F15B *13/042*

U.S. Cl. 137—625.66 **3 Claims**



1. A valve assembly comprising: a generally cylindrical housing, a movable wall formed by a diaphragm and a stationary wall disposed in said housing and dividing said housing into a control chamber at one side of said diaphragm, a constant pressure chamber between said diaphragm and stationary wall and an operating chamber at one side of said stationary wall, a first valve passage communicating with said constant pressure chamber and said operating chamber, a pressure supply port, a second valve passage communicating said operating chamber with said supply port, an actuating port communicating with said operating chamber, valve closure means being movable between a position wherein said first valve passage is closed and said second valve passage is open and a position in which said first valve passage is open and said second valve passage is closed, said valve closure means being connected to said movable wall for movement therewith by way of an axially movable operating member extending through said diaphragm and held in sealing engagement with said one side of said diaphragm in response to pressure in said control chamber less than said pressure in said constant pressure chamber for movement of said operating member with said diaphragm between said positions upon establishing a control pressure in said control chamber to place said supply port in communication with said operating chamber when said valve closure means is in one of said positions and to close said supply port and open said operating chamber and actuating port to the atmosphere when said valve closure means is in another of said positions, an end wall disposed coaxially with said stationary wall, said supply and actuating ports axially extending from said end wall, one of said ports being disposed radially outwardly from the axis of said housing, said walls being disposed in sealing engagement with each other to form an annular chamber, and radially inwardly extending passage means communicating said annular chamber with said operating chamber, said stationary wall and end wall being disposed in random relationship to each other about the axis of said housing, said one of said ports communicating with said annular chamber for all positions of said stationary wall relative to said end wall.

4,416,308

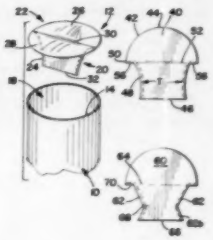
FLEXIBLE ONE-WAY VALVE AND METHOD OF PRODUCING

James F. Bower, 7598 Frazer Dr., Riverside, Calif. 92509

Continuation of Ser. No. 98,735, Nov. 30, 1979, abandoned. This application Apr. 1, 1982, Ser. No. 364,224

Int. Cl.³ F16K *15/14*

U.S. Cl. 137—846 **5 Claims**



1. In a flexible one-way valve of the type incorporated into the open end of a distensible bag, said valve formed from two flexible members having identical peripheral configurations and adhered along selected edges to form a planar valve support and a valve portion depending from and perpendicularly disposed to said valve support, said valve being seated in said open end by adhering peripheral edges of said support to peripheral edges of said open end, the improvement comprising:

a valve portion having an inlet of maximum width and an outlet, said valve portion having opposing sealed peripheral edges tapering inward to define a substantially intermediately positioned throat, said throat having a width lesser than either said inlet or said outlet and said opposing edges tapering outward from said throat to said outlet, whereby said throat in said valve portion prevents outward displacement of said valve portion upon inversion of said bag.

4,416,309

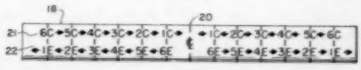
INDEXED PIPE

Hamid Salim, 6898 Bowie Rd., Cambridge, Ohio 43725

Filed Jun. 7, 1982, Ser. No. 385,554

Int. Cl.³ F16L *9/00, 55/00*

U.S. Cl. 138—104 **5 Claims**



1. An indexed underground type pipe, comprising: a rigid hollow cylindrical geometric shaped pipe section for burial underground, a connection means at each end of said pipe section for underground connection to another pipe section, a first references scale longitudinally marked along said pipe section, a second reference scale longitudinally marked along said pipe section adjacent to and parallel with said first reference scale whereby a small excavation through the ground to expose a portion of said pipe section will reveal both said first and second reference scales, said first reference scale comprising a first series of numeric indications and a first indication means associated with each of said first numeric indications for referencing each of said first numeric indications to at least one particular point on said pipe section, said second reference scale comprising a second series of numeric indications complementary to said first series of numeric indications and a second indicating means associated with each of said second numeric indications for referencing each of said second series

to at least one particular point on said pipe section, whereby the first and second numeric designations and their associated indicating means exposed by the small excavation provides identification of the longitudinal extent to both ends of said pipe section.

4,416,310

DOUBLE-LIFT JACQUARD MECHANISM

Paul Sage, Lyons, France, assignor to Verdol S.A., Caluire, France

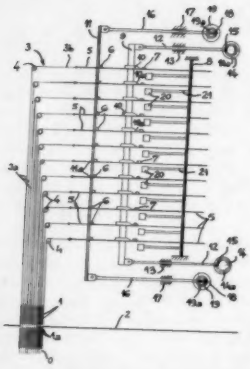
PCT No. PCT/FR81/00019, § 371 Date Oct. 5, 1981, § 102(e) Date Oct. 5, 1981, PCT Pub. No. WO81/02434, PCT Pub. Date Sep. 3, 1981

PCT Filed Feb. 17, 1981, Ser. No. 309,970

Claims priority, application France, Feb. 22, 1980, 80 04281

Int. Cl.³ D03C *3/20, 3/06*

U.S. Cl. 139—59 **9 Claims**



1. An improved Jacquard mechanism operative to open the shed of warp threads in a loom by double-lift displacements of heddles according to information taken from a pattern selecting device, the mechanism comprising:

(a) a first plate and a second plate reciprocated by the loom toward and away from each other, the plates having apertures therethrough which are mutually aligned;

(b) multiple resilient blades associated respectively with the heddles, the blades passing transversely of the plates through their apertures, and the blades being respectively connected at one end with corresponding heddles and operative to displace the heddles;

(c) a shoe fixed to each blade between the first and second plates and operative to abut the second plate and support the blades against the second plate whereby to lower heddles associated with said blades as the second plate is reciprocated;

(d) a catch on each blade, and a bar fixed transversely through the first plate at each aperture and disposed parallel to the blade thereat and having a catch-engaging end disposed to abut the catch of the adjacent blade in the blade's normal position, whereby reciprocation in the first plate engages the bars with the catches and displaces the associated heddles to raised positions; and

(e) blade deflecting means associated with each blade, each deflecting means being under the control of a pattern selecting device and operative thereby to deflect the blade at the beginning of reciprocation of the first plate from the blade's normal position to a deflected position in which the catch can pass by said end of the bar and through said first plate, whereby a deflected bar is displaced only by reciprocation of the second plate to lower its associated heddle.

4,416,311

TREE HARVESTER

Andrew Gemmell-Murdoch, Glastonbury via Gympie, Australia, assignor to Murdoch Logging Industries Pty. Ltd., Gympie, Australia

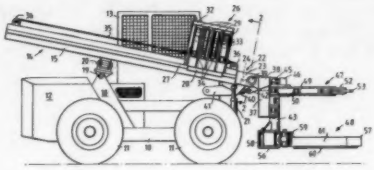
PCT No. PCT/AU80/00102, § 371 Date Jul. 21, 1981, § 102(e) Date Jul. 21, 1981, PCT Pub. No. WO81/01496, PCT Pub. Date Jun. 11, 1981

PCT Filed Dec. 1, 1980, Ser. No. 285,117

Claims priority, application Australia, Dec. 5, 1979, PE1620

Int. Cl.³ D01G *23/08*

U.S. Cl. 144—3 D **12 Claims**



1. A tree harvester comprising:

a de-limbing carrier:

a grapple carrier slidably mouonted on said de-limbing carrier for longitudinal movement relative to said de-limbing carrier;

a grapple assembly mounted on said grapple carrier for releasably gripping a tree trunk;

a shear assembly for severing the tree trunk;

a de-limbing assembly, movably mounted on said de-limbing carrier, for engaging releasably about the tree trunk;

and

moving means connected to said grapple assembly and said de-limbing assembly for simultaneously moving said grapple assembly relative to said de-limbing assembly in a direction away from, or towards, each other, said moving means including a first means for longitudinally moving said grapple carrier and grapple assembly in a first direction relative to said de-limbing carrier and a second means interconnecting said de-limbing assembly and said grapple carrier to move said de-limbing carrier as said first means moves said grapple carrier in the first direction relative to said de-limbing carrier.

4,416,312

GUIDING MECHANISM FOR TIMBER CUTTING MACHINES

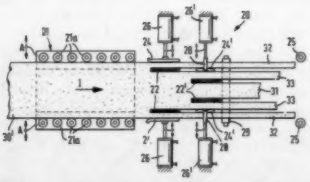
Sven E. Östberg, Söderhamn, Sweden, assignor to Kockums Industri A.B., Soderhamn, Sweden

Filed Jun. 24, 1981, Ser. No. 276,960

Claims priority, application Sweden, Jul. 3, 1980, 8004919

Int. Cl.³ B27C *9/00, 1/08;* B27B *15/08;* B27M *1/00*

U.S. Cl. 144—39 **10 Claims**



7. A machine for cutting a succession of logs, said machine comprising:

adjustable cutting means for cutting the oppositely disposed side portions of a log to produce an elongated block having substantially parallel, planar lateral surfaces, said cut-

ting means being adjustable for cutting each successive log to a block having a preselected lateral separation between said lateral block surfaces;

sawing means for longitudinally cutting at least one board from said block, said sawing means being spaced from said cutting means in the direction of feed of said block;

infeed guide means positioned between said cutting means and said sawing means to engage said lateral block surfaces for fixing the lateral position of said block prior to said block reaching said sawing means, said infeed guide means being adjustable for engaging said lateral block surfaces of said block being cut by said cutting means; and

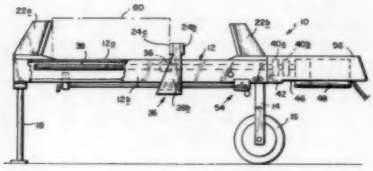
guide means positioned laterally adjacent said sawing means and operable independent of said infeed guide means to engage said lateral block surfaces of said block being cut by said sawing means for fixing the lateral position of said block while being cut in order to prevent said block from applying a lateral torque to said sawing means, said guide means being adjustable for engaging said lateral block surfaces of said block being cut by said sawing means independent of the adjustment of said infeed guide means.

4,416,313

DOUBLE ACTING LOG SPLITTER

Richard E. Seeger, Kittery Point, Me., assignor to Armatron International, Inc., Melrose, Mass.

Filed Oct. 30, 1981, Ser. No. 316,884
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 R **10 Claims**



1. A double acting log splitter comprising:

a frame defining a longitudinally extending log supporting surface;

a pair of mutually spaced fixed splitting components arranged in a confronting relationship at opposite ends of said supporting surface;

a carriage mounted on said frame for movement in opposite directions between said fixed splitting components;

a movable splitting component mounted on said carriage at a location overlying said supporting surface, said movable splitting component being arranged to coact with either of said fixed splitting components to split a log positioned axially therebetween on said supporting surface;

a screw located beneath and extending in a direction parallel to the length of said supporting surface;

bearing means for rotatably supporting one end portion of said screw, with the remainder of said screw extending in cantilever fashion from said bearing means;

a nut connected to said carriage and threaded onto said screw; and

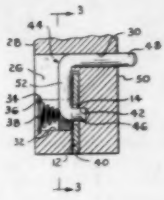
reversible drive means connected to the said one end portion of said screw for rotatably driving said screw in one direction to move said nut and said carriage towards one of said fixed splitting components, and for rotatably driving said screw in the opposite direction to move said nut and said carriage towards the other of said fixed splitting components.

4,416,314

HACKSAW BLADE CONNECTING MEANS

Jerome C. Uskert, 21 N. 675 W., Valparaiso, Ind. 46383

Filed Jun. 21, 1982, Ser. No. 390,289
Int. Cl.³ B27B *21/02*
U.S. Cl. 145—33 R **5 Claims**



1. In a hacksaw frame and blade combination wherein the hacksaw frame includes a handle member, and a longitudinally spreadable contractable member having spaced end parts supporting the ends of a hacksaw blade, the improvement thereof comprising;

each of said parts of said hacksaw frame being formed with a slotted recess and spaced first and second holes in said part;

said part having a second slotted recess in said part intersecting said first slotted recess for receiving therein one end of said hacksaw blade;

a pin having a "U" shape, one leg thereof extending through said first mentioned hole in said part, a second leg of said pin member being truncated and extending into said second hole, and a base member connecting said legs moveable laterally in said grooved recess; and

a spring member anchored in said grooved recess, one end thereof engaging said base of said pin biasly retaining said first and second legs in said holes.

4,416,315

DEVICE FOR CARRYING VALUABLES

Newman C. Foley, Superior, Wis., assignor to N.B.F. Company, Inc., Superior, Wis.

Filed Jan. 18, 1983, Ser. No. 458,973
Int. Cl.³ A44B *21/00*
U.S. Cl. 150—47 **7 Claims**

1. A device for carrying valuables comprising:

a container for the valuables, said container having means for selectively opening or closing it and having an aperture in one end thereof;

a hanger support member movably mounted within said container;

a hanger member movably connected at one end to said support member;

said hanger member and said support member being mov-

able between a first extended position wherein said support member is disposed adjacent said one container end and said hanger member is removed from said container, and a second retracted position wherein said support member is positioned inwardly from said one container end and said one end of said hanger member is disposed within said container with a portion of said hanger member extending through said container aperture; and

means on said container and said support member for releasably maintaining said support member and said hanger member in said retracted position.

4,416,316

TIRE TREADS AND TIRES

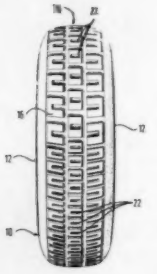
Michael C. Clatworthy, Staffordshire; William P. S. Mack, Birmingham, and Douglas J. Major, Sutton Coldfield, all of England, assignors to Dunlop Limited, London, England

Filed Mar. 6, 1981, Ser. No. 241,222

Claims priority, application United Kingdom, Mar. 13, 1980, 8008633

Int. Cl.³ B60C *11/10*

U.S. Cl. 152—209 R **8 Claims**



1. A tread for a temporary replacement tire for producing a deliberately audible alternating two note sound during normal running in unworn or partially worn condition of the tread, said tread comprising a tread pattern formed from the same material as the tread having two circumferentially displaced first and second circumferential parts, each extending approximately one half of the total tire circumference; each circumferential part comprising a regular tread pattern having at least one circumferentially extending row of tread blocks defined by grooves, some of the blocks having pockets in the tread pattern and spaced apart in the circumferential direction, the leading edges of said pockets being generally transverse to the direction of travel and the pockets being shaped as substantially closed geometric figures; the pitch of the first circumferential part being approximately twice that of the second circumferential part.

4,416,317

PNEUMATIC TIRE FOR MOTOR VEHICLES HAVING A TREAD PATTERN WHICH ADAPTS THE TIRE FOR GOOD PERFORMANCE AND LOW ROAD NOISE

Renato Caretta, Gallarate, Italy, assignor to Societa' Pneumatici Pirelli S.p.A., Milan, Italy

Filed Dec. 1, 1981, Ser. No. 326,401

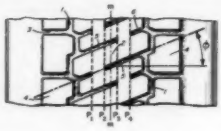
Claims priority, application Italy, Dec. 5, 1980, 26490 A/80

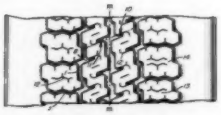
The portion of the term of this patent subsequent to Aug. 30, 1997, has been disclaimed.

Int. Cl.³ B60C *11/08, 11/12*

U.S. Cl. 152—209 R **6 Claims**

1. In a pneumatic tire for motor vehicles which has on its radially outer surface a tread band provided with a tread pattern comprising at least three longitudinal grooves, with a central groove along the tire midline and two longitudinal grooves symmetrical with respect to the tire midline, which divide the tread band into circumferential portions having substantially the same width; the two axially outer circumferential portions being further divided into a plurality of circumferentially spaced apart blocks by a plurality of transverse grooves extending in a substantially axial direction, the inner circumferential portions being at least two continuous circumferential ridges, the edges of said ridges being grooved with oblique grooves all inclined in the same sense with respect to the midline of the tire and substantially parallel to one another, the improvement comprising each said oblique groove having





a rectilinear axis inclined with respect to said midline of the tire at an angle of between 55° and 75°, the projections of the axis of the oblique grooves on one edge of each ridge being distinct from the axis of the oblique grooves on the other edge of that ridge; the oblique grooves on the axial inner edges of said two ridges being generally in alignment with each other so as to form a single oblique groove extending on both sides of said central groove, the projections of all said oblique grooves along the circumferential direction of the tire constituting parallel lines which do not overlap.

4,416,318

ANTI-SKID CHAIN AND MAKING THEREOF

Hansjörg Rieger, Aalen, and Dietmar H. Holzwarth, Schwäbisch Gmünd, both of Fed. Rep. of Germany, assignors to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co., Aalen, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 358,451

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1981, 3111271; Mar. 17, 1981, 8108431[U]

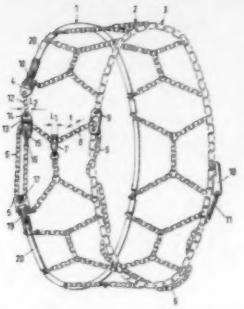
Int. Cl.³ B60C *27/00*; B21D *39/00*; B21F *15/02*

U.S. Cl. 152—213 A **23 Claims**

1. Anti-skid chain for vehicle tyres, said chain having retaining means including an inner retaining device and an outer retaining device, which, when the chain is assembled, come to rest respectively against the inner side and the outer side of the tyre, said retaining devices serving to retain chain-strand lengths extending over the tread, said inner retaining device comprising a resilient arcuate member adapted to be resiliently slipped over the tire and a chain tensioning strand for tensioning said arcuate member and bridging a gap between the ends of said arcuate member, said chain tensioning strand having at least one free end which, after being deflected at least once by a deflection device, is guided over the tread of the tyre to the outer retaining device, said deflection device (13) guiding the tensioning strand (6) out of the region of the inner retaining device (1) to the tread is held at a distance from end parts (4, 5) of the inner retaining device (1) by connecting elements (6, 12) movable relative to the inner retaining device (1).

23. Process for producing an anti-skid chain according to

claim 1, characterised by attaching the end parts (4, 5) to the inner retaining device (1) consisting of elastic spring-steel wire,



after the ends of the inner retaining device (1) have previously been given a corrugated deformation.

4,416,319

CLOSURE FOR TIRE CHAINS

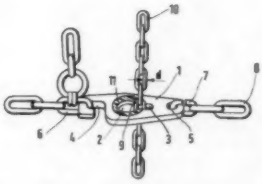
Peter Hofmann, Aalen-Unterkochen, Fed. Rep. of Germany, assignor to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co., Aalen, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 401,339

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129907

Int. Cl.³ B60C *27/00*

U.S. Cl. 152—213 R **22 Claims**



1. Closure for tyre chains, including non-skid tyre chains, with a basic body with at least one connecting lug for the end member of a retaining line and with a pull-through orifice having an elastic insert for a tension-chain line, as well as with a locking slot adjacent to this pull-through orifice for locking the tension-chain line, characterised in that the insert (11) overlapping the basic body (1) on both sides by means of retaining shoulders (17, 18) forms at least one engagement cam (13, 14) narrowing the mouth (12) of the locking slot (3), for the elastic clamping of a leg of a chain link (9) of the tension-chain line (10), this leg being introduced into the locking slot (3) by overcoming the engagement cam (13, 14).

4,416,320

LADDER TAPE ROLL FOR VENETIAN BLINDS

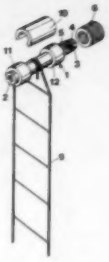
Inge Nordin, Hökerum, Sweden, assignor to Roland Olofsson, Lerum, Sweden

Filed Jul. 14, 1982, Ser. No. 398,387

Int. Cl.³ E06B *9/38*

U.S. Cl. 160—177 **2 Claims**

1. A ladder tape roll for venetian blinds and having a through hole intended for receiving and for non-rotatable connection with the tilting bar of the blind and provided with means for axial locking of the ladder tape roll in relation to the tilting bar and further being provided with fixing means for the ladder tapes of the blind, wherein one end of the ladder tape roll is conically tapered, said tapered end being provided with a slot and having a portion with outer threads, a nut having inner threads and an inner conical portion of smaller dimensions than the conical portion of the roll being arranged by tightening on said threads to press the slotted portion of the roll together for squeezing and locking the ladder tape roll axially to the tilting bar.



4,416,321

METHOD OF MANUFACTURE OF ARTICLES WITH INTERNAL PASSAGES THEREIN AND ARTICLES MADE BY THE METHOD

John Goddard, and David Mills, both of Bristol, England, assignors to Rolls Royce Limited, London, England

Filed Jul. 6, 1981, Ser. No. 280,213

Claims priority, application United Kingdom, Jul. 17, 1980, 8023396

Int. Cl.³ B22D *23/06, 27/04*

U.S. Cl. 164—80 **5 Claims**

1. A method of making an article having one or more internal passages therein comprises the steps of:

(a) making a pre-form of the article in at least two pieces, with each passage at least partially formed in one or more of the pieces of the pre-form,

(b) making one or more casting cores each of appropriate shape to define a required passage in the finished article,

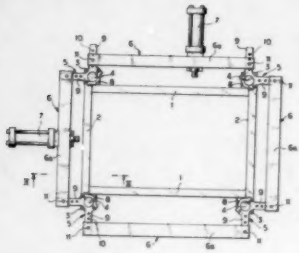
(c) assembling the pre-form and the cores in a predetermined position in a casting mould, and

(d) heating the pre-form to a sufficient temperature to melt it and thereafter allowing it to cool to form the finished article.

4,416,322
MOULDING MACHINE, MORE ESPECIALLY A CHILL MOULDING MACHINE COMPRISING A FRAMEWORK AND AT LEAST ONE CORE EXTRACTION JACK MOUNTED ON A BEARING ELEMENT MOVABLE ON THE FRAMEWORK

Michel Tremeaux, 11 Rue Clement Ader, 71100 Chalon sur Saone, France

Filed Jun. 1, 1981, Ser. No. 268,771
Claims priority, application France, Jun. 27, 1980, 80 14425
Int. Cl.³ B22D *33/04*
U.S. Cl. 164—340 **9 Claims**

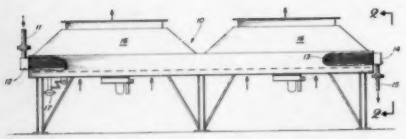


1. A moulding machine, and especially a chill moulding machine, comprising a framework and at least one core or middle part extraction jack **7** mounted on a bearing element **6** movable on the framework characterized in that the bearing element **6** is carried by at least two supports **5** secured against movement on guide devices **4** provided on the framework and in that the supports **5** each comprise a securing member **8** locked on the corresponding guide device **4** and each support **5** comprises two arms **9** positioned at right angles to each other and integral at their proximal ends with the supports **5** and means **11** mounting the ends of the bearing element **6** to an arm **9** of each of the supports **5**.

4,416,323
AIR COOLER FREEZE PROTECTION

David A. Evens, Cloquet, Minn., assignor to Conoco Inc., Ponca City, Okla.

Filed Sep. 29, 1980, Ser. No. 191,881
Int. Cl.³ F28F *11/00*
U.S. Cl. 165—11 R **4 Claims**



1. A method of protecting an ambient air cooled heat exchanger having a plurality of rows of tubes from freeze-up during cold weather operation comprising:

(a) inserting, from the outlet ends thereof, thermocouple means into the interior of tubes in the row nearest the incoming cooling air, said thermocouple means being positioned far enough in said tubes to substantially negate the effect of the temperature of fluid collected from other tubes;

(b) maintaining at least 80 percent of the internal cross-sectional area of said tubes open to flow about said thermocouple means;

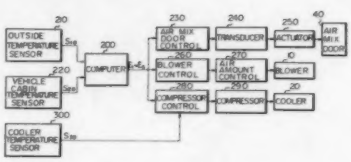
(c) monitoring the outputs from said thermocouple means to obtain an indication in the event of the temperature in any of said tubes nearing the freezing point; and

(d) reducing the air flow over said tubes in the event of an indication of the temperature in any of said tubes nearing the freezing point.

4,416,324
VEHICLE TEMPERATURE CONTROL APPARATUS

Shinji Sutoh; Hara Toshizo; Hiroyuki Sugiura, and Toshio Kojima, all of Konan, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Apr. 3, 1981, Ser. No. 250,973
Claims priority, application Japan, Apr. 10, 1980, 55-47373
Int. Cl.³ F28F *27/00*
U.S. Cl. 165—12 **4 Claims**



1. An air conditioning apparatus for a vehicle comprising:

an air flow duct communicating with a vehicle cabin;

a blower for forcing air through the duct;

a cooler for cooling air in the duct;

a heater for heating air in the duct;

a temperature control door disposed in the duct for controlling a proportion of air passing through the heater; and

operation control means for correlatively or cooperatively controlling the blower, cooler and temperature control door, said operational control means being constructed in such a manner that, when it is desired to raise the vehicle cabin temperature while operating in a maximum cooling mode, the operating speed of the blower is progressively decreased from an upper limit to a lower limit and maintained at the lower limit, the temperature control door is maintained at a position for preventing the heater from heating air passing through the cooler until the speed of the blower reaches the lower limit and starts to heat air passing through the cooler when the speed of the blower settles at the lower limit, and the cooler turn-off temperature level is maintained at a predetermined lower level until the speed of the blower reaches the lower limit and changed to a predetermined upper level when the speed of the blower reaches the lower limit;

said operation control means being constructed to further correlatively or cooperatively control the blower, cooler and temperature control door in such a manner that the speed of the blower is progressively increased from the lower limit to the upper limit when the cooler turn-off temperature level is maintained at the predetermined upper level and the temperature control door continues to heat air passing through the cooler.

4,416,325
HEAT EXCHANGER

Robert O. Barratt, Cedar Knolls, and Howard N. Franklin, Parsippany, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

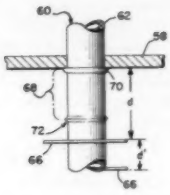
Filed Mar. 31, 1980, Ser. No. 135,419
Int. Cl.³ F28D *15/00*; F23L *15/04*
U.S. Cl. 165—47 **7 Claims**

1. A combustion air preheater for heaing combustion air with heat energy provided from hot flue gas, said preheater comprising, in combination:

a first heat exchanger having a partition separating the first heat exchanger into lower and upper heat transfer compartments, a plurality of heat pipes extending from within said lower heat transfer compartment to within said upper

heat transfer compartment for effecting heat transfer therebetween, each of said heat pipes comprising a closed cylindrical wall having an upper portion and a lower portion and a plurality of fins extending radially outward from said wall, said wall extending through a hole in said partition of substantially the same diameter as said wall, said upper portion being welded to said partition at the lower surface thereof, said upper and lower portion being welded together at a location below said partition, with at least the distance between the welded joint and the partition being devoid of any fin the resulting area devoid of fins being sufficient so that the removal of heat is limited to the extent that the partition is heated to a temperature high enough to avert excessive precipitation of moisture and the concomitant corrision at the upper surface thereof;

a second heat exchanger defined by a plurality of tubes supported in a shell by tube sheets for transferring heat energy from one side of said tubes to the other side thereof;



first duct means for conveying the flue gas into said second heat exchanger and over the exterior surfaces of said tubes and to such lower compartment in said first heat exchanger; and

second duct means for conveying the combustion air into and through the upper compartment of said first heat exchanger; and through said tubes of said second heat exchanger;

whereby the hot flue gas is passed over the exterior surface of said tubes and then through said lower compartment and the combustion air is passed through the upper compartment and then through the interior of said tubes so that heat energy from the flue gas in a first higher temperature range is transferred through said tubes in said second heat exchanger to the combustion air and additional heat energy from said flue gas in a lower temperature range is transferred to said combustion air from the lower compartment to the upper compartment through said heat pipes.

4,416,326

APPARATUS FOR MELTING REFRIGERATED BUTTER

Johannes M. H. Van Vlaenderen, Amstelveen, Netherlands, assignor to Alfa-Laval N.V., Amstelveen, Netherlands

Filed Dec. 28, 1981, Ser. No. 335,096

Claims priority, application European Pat. Off., Dec. 29, 1980, 80201237.7

Int. Cl.³ F28F *13/00*

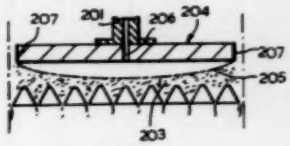
U.S. Cl. 165—120 **9 Claims**

1. An apparatus for melting a refrigerated substance, said apparatus comprising:

a frame;

a grating rigidly attached to said frame in a substantially horizontal plane, and comprising a plurality of tubes which are adapted to receive a hot medium therethrough; and

a mechanically energized punching means displaceably associated relative to said frame for pressing a block of said substance which is to be melted against and through said grating, said substance passing into a molten state as a result of contact with said hot tubes, and being discharged in liquid form through said grating, said tubes of said grating being provided with walls, that wall portion of a



given tube facing away from said block of substance to be melted being provided with a heat barrier.

4,416,327

CASING FOR AN INTERIOR UNIT OF A SPLIT TYPE OF AN AIR CONDITIONING APPARATUS

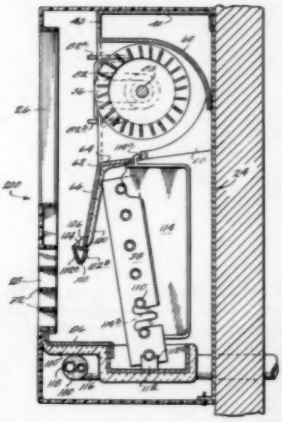
Minoru Nakada, Fujishi; Yashiro Shimma, Shimadashi; Osamu Inoue, and Sei Suma, both of Fujishi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Oct. 7, 1980, Ser. No. 195,069

Claims priority, application Japan, Oct. 13, 1979, 54-132064

Int. Cl.³ F24H *3/06*; F25D *21/14*

U.S. Cl. 165—122 **6 Claims**



1. A casing for an interior unit of an air conditioning apparatus comprising:

a first integrally molded housing having a front panel with a plurality of apertures, a pair of opposite first side walls connected to said front panel and a pair of opposed top and bottom walls connected to said front panel and first said side walls, respectively,

a second integrally molded, one piece housing sized to fit inside said first housing comprised of an upper wall and two outer side walls, said upper wall having a front edge, a first vertical separator wall spaced inwardly from one side wall so as to extend substantially parallel with said one side wall, a curved upper rear wall positioned between the other side wall and said first separator wall and spaced below said upper wall, said curved wall having a top and bottom edge, said top edge being connected to the front edge of said upper wall and extending rearwardly and donwardly therefrom, a horizontal separator wall positioned between said other side wall and said first separator wall and beneath said curved rear wall for separating the area within said first housing into separate fan and heat exchange chambers, said horizontal separator

including a flat portion having front and rear edges, an upstanding projection extending from said rear edge substantially along the whole length of said rear edge, a flap portion extending downwardly at a predetermined angle from said front edge and terminating along bottom edge and a plurality of spaced apart rib members connected to and extending between the upstanding projection and the bottom edge of said curved upper rear wall, and

a rear wall means removably attached to the wall of room for housing said second housing.

4,416,328

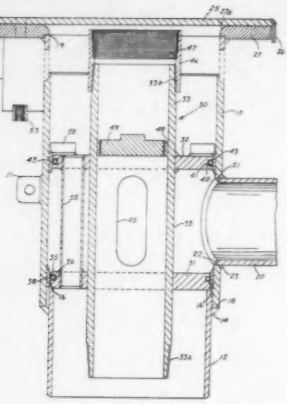
PITLESS ADAPTER

Henry A. Baski, 1586 S. Robb Way, Denver, Colo. 80226

Continuation-in-part of Ser. No. 99,831, Dec. 3, 1979, Pat. No. 4,298,065. This application Nov. 2, 1981, Ser. No. 317,452

Int. Cl.³ E21B *33/04*

U.S. Cl. 166—65 R **22 Claims**



1. A pitless adapter assembly for a water well system or the like operable by a submersible type pump having a motor in the well or a turbine type pump having a motor above the well to pump underground water or other fluids upwardly through a relatively small diameter drop pipe string mounted within a relatively large diameter casing pipe string to a laterally extending discharge pipeline located a substantial distance beneath the ground, and comprising:

an outer barrel means for providing an elongated annular cavity extending from the upper end portion of the casing pipe to the surface of the ground and having a lowermost portion with a central opening at the bottom end thereof adapted to be fixedly connected to an uppermost portion of the well casing pipe located beneath the discharge pipe; a laterally extending discharge opening in an intermediate portion adapted to be connected to the discharge pipe; and an uppermost portion with an inlet opening at the upper end thereof and extending upwardly from the discharge pipe to ground level; the outer barrel means further comprising:

said lowermost portion being made of one piece of pipe having a diameter approximately equal to the diameter of the casing pipe;

said intermediate portion being made of one piece of pipe having an inside diameter larger than the outside diameter of said lowermost portion;

the upper end of said lowermost portion being telescopically received within the lower end of said intermediate portion and fixedly connected thereto;

annular seat means extending laterally between said lowermost portion and said intermediate portion for providing an upwardly facing abutment surface;

a pair of axially vertically spaced concentric annular flat sealing surfaces in said intermediate portion having a diameter less than the inside diameter of said intermediate portion and greater than the diameter of said lowermost portion, the of said sealing surfaces being located in axially upwardly vertically spaced relationship to said discharge opening and the other of said sealing surfaces being located in axially downwardly vertically spaced relationship to said discharge opening;

said uppermost portion being made of one piece of pipe having an inside diameter approximately equal to or greater than the inside diameter of said intermediate portion;

an inner spool means mounted in said barrel means for directing the flow of water from the drop pipe to the discharge pipe and having a continuous one piece center pipe with a lowermost portion adapted to be connected to an uppermost portion of the drop pipe adjacent the connection of said outer barrel means to the well casing pipe; an uppermost portion adapted to be connected to a tool for raising and lowering said spool means and the drop pipe; a pair of axial spaced annular plate members fixedly mounted on the outer periphery of said center pipe and defining an annular cavity therebetween adapted to be located axially opposite said discharge opening with one plate member axially vertically spaced thereabove and the other plate member axially vertically spaced therebelow; a discharge opening in said center pipe located axially opposite said annular cavity; and means associated with an upper portion of said center pipe for preventing upward flow of water therethrough;

said plate members being axially vertically spaced a distance approximately equal to the axial distance between said sealing surfaces on said intermediate portion of said barrel means, and having a peripheral diameter less than the inside diameter of said intermediate portion and said upper portion of said barrel means and greater than the inside diameter of said lower portion;

a sealing means mounted on the periphery of each of said plate members for compressible sealing engagement with said sealing surfaces;

a seating means on the lowermost plate member for abutting engagement with said annular seat means on said barrel means to supportively hold said spool means in said barrel means with said sealing means in sealing engagement with said sealing surfaces to prevent flow of water from said annular cavity between said plate members and said intermediate portion of said barrel means;

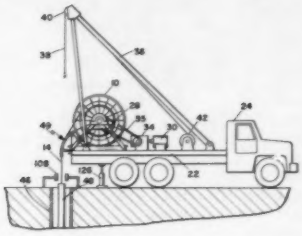
the construction and arrangement of said barrel means and said spool means being such that said spool means is freely telescopically movable upwardly and downwardly relative to said barrel means along the entire distance between said seat means in said intermediate portion and said inlet opening at the upper end of said upper portion of said barrel means whereby, after said barrel means is connected to the casing pipe, said spool means is connectable to the drop pipe at ground level above said inlet opening and said spool means and said drop pipe are lowerable into said barrel means until said seat means on said barrel means becomes engaged with said seating means on said spool means whereafter said spool means and said drop pipe are held against vertical downward movement by said barrel means while being vertically upwardly movable to subequently remove said spool means and said drop pipe from said barrel means; and

a cover means adapted to be removably mounted on the upper end of said barrel means across said inlet opening after said spool means has been inserted therein.

4,416,329
OIL WELL SETUP AND PUMPING APPARATUS

Curtis J. Tanner, San Diego; Richard E. Bender, Escondido; Anton K. Simson, Poway, and Hugh McCutchen, Jr., San Diego, all of Calif., assignors to Henlan, Inc., Midland, Tex.

Filed Aug. 13, 1981, Ser. No. 292,590
Int. Cl.³ E21B *17/00, 17/04, 19/08*
U.S. Cl. 166—68 **14 Claims**



14. A ribbon rod for use in oil well apparatus to replace a conventional steel sucker rod, comprising:

an elongated ribbon of relatively stiff fiber reinforced plastic having a limited degree of flexibility with the reinforcing fibers having a modulus of elasticity on the order of about fifty five million pounds per square inch so that said ribbon will effectively transmit pumping forces and be windable upon a reel; and

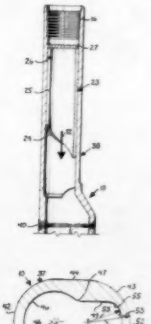
face strips of woven fabric bonded on the faces of said ribbon to provide transverse bending strength and stiffness; and

an edge protection strip formed of material such as glass or Kevlar bonded to each edge of said ribbon, said edge strips facilitating the pultrusion process used in making said ribbon.

4,416,330
SIDE POCKET MANDREL

David T. Merritt, Celina; David W. Fish, Carrollton, and Olen R. Long, Celina, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Feb. 19, 1982, Ser. No. 350,283
Int. Cl.³ E21B *23/02*
U.S. Cl. 166—117.5 **9 Claims**



1. A side pocket mandrel, comprising:

a. a one-piece main body section having

i. a main bore therethrough,

ii. a receptacle bore alongside said main bore,

iii. port means communicating said receptacle bore with the exterior of said main body section, and

iv. means on its lower end for attachment to a well tubing string; and

b. an upper body section welded to the upper end of said main body section by a circumferential weld, said upper body section having

i. connecting means at its upper end providing a reduced diameter portion adapted for connecting the upper body section to a well tubing string,

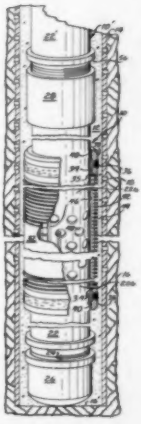
ii. a main passage through said upper body section including said connecting means in alignment with the main bore of said main body section, and

iii. a longitudinal groove in the inner wall of said main passage extending upwardly from said receptacle bore substantially to said upper reduced diameter portion and providing space above said receptacle bore for operation of a kickover tool for inserting a flow control device therein, the upper body wall, surrounding said main bore and said groove, being thicker on either side of said groove and tapering in thickness toward opposed locations on a transverse plane where the axis of symmetry passes through the wall section.

4,416,331
BIMETALLIC WELL SCREEN FOR USE IN INJECTION WELLS AND METHOD OF MAKING SAME

James A. Lilly, Minneapolis, Minn., assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 11, 1982, Ser. No. 347,829
Int. Cl.³ E21B *43/08*
U.S. Cl. 166—236 **8 Claims**



1. A bimetallic well screen assembly for use in an injection well at elevated temperatures comprising a pipe base member having a perforated portion intermediate its ends and unperforated portions adjacent thereto, an integral well screen member having a slotted portion overlying said perforated portion and unslotted end ring portions at each of its ends overlying said unperforated portions, said slotted portion extending continuously between said end ring portions, said well screen member having a temperature coefficient of expansion which is greater than the temperature coefficient of expansion of the pipe base member, said end ring portions having a radially compressed shrink fit connection to the underlying pipe base member at atmospheric temperatures, but being either slightly out of contact with said pipe base member or at least substantially unstressed at elevated operational temperatures, any spacing between said other end ring and said pipe base member

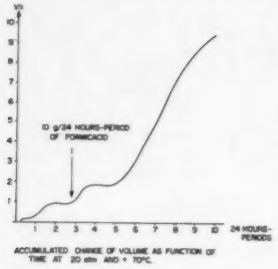
at said elevated operational temperatures being no greater than the maximum width of the slot openings in the slotted portion of the screen member.

4,416,332

METHOD FOR INCREASING THE PRESSURE IN OIL-BEARING GEOLOGICAL STRUCTURES

Lars I. Wiberger, Skara; Peter H. Rönnow, Mölnlycke; Per F. Tengblad, Upsala, and Bert G. H. Hellman, Akersberga, all of Sweden, assignors to Chemical Dynamics Sweden AB, Grabo, Sweden

Continuation of Ser. No. 85,713, Oct. 17, 1979, Pat. No. 4,300,632. This application Jun. 3, 1981, Ser. No. 269,993
Claims priority, application Sweden, Oct. 26, 1978, 78111118
The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—246 **4 Claims**



ACCUMULATED CHANGE OF VOLUME AS FUNCTION OF TIME AT 20 atm AND + 70°C.

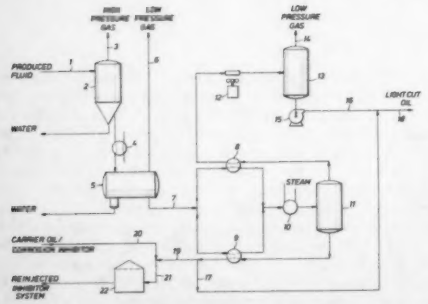
1. A method for increasing pressure in geological oil-bearing structures by gas production due to microbial activity, said method comprising adding to a geological oil-bearing structure a methane producing aneorobic micro-organism, a culture medium and formic acid such that the formic acid is converted to carbon dioxide and methane gases resulting in increased pressure in said structure.

4,416,333

CORROSION INHIBITING PROCESS FOR A REMOTELY LOCATED DEEP CORROSIVE GAS WELL

David L. Mundhenk, and Michael A. Curole, both of Metairie, La., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 20, 1982, Ser. No. 370,017
Int. Cl.³ E21B *43/40, 47/06*
U.S. Cl. 166—250 **4 Claims**



1. A process for controlling corrosion in a well which produces a hot, highly pressurized, corrosive gas, by continuously injecting an oil-phase liquid containing an oil-soluble corrosion inhibitor, comprising:

treating such a well which (a) is located remotely with respect to the source of a manufactured carrier oil that is capable of maintaining an oil-phase liquid at the bottomhole conditions within the well to be treated and (b) produces, or is near a well which produces, a gas which contains a significant proportion of high-boiling, oil-soluble, organic compounds which condense as a liquid phase when the produced gas is cooled and depressurized;

determining phase characteristics, at the bottomhole temperature and pressure in the well to be treated, of mixtures of the gas produced by the well to be treated, a condensate comprising the high boiling components of gas produced from that well or a nearby well, a corrosion inhibitor which is effective at the bottomhole temperature within the well to be treated and a manufactured carrier oil capable of containing that corrosion inhibitor in a separate liquid-phase in contact with the gas produced by the well to be treated at the reservoir pressure and temperature of the well to be treated; and

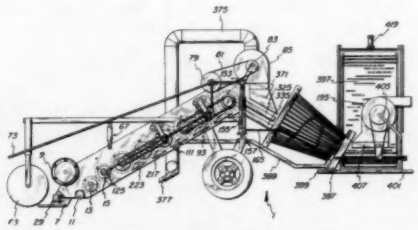
continually circulating into the well to be treated a mixture of the so-tested components in proportions such that the mixture is capable of maintaining a corrosion inhibitor-containing liquid-phase at the bottomhole pressure and temperature of the well to be treated when the amount of the manufactured carrier oil is less than that needed to maintain such a liquid phase when none of the condensate is present but enough of the manufactured carrier oil is present to maintain such a liquid-phase during fluctuations of the extent likely to occur in the composition of the condensate or reservoir temperature or pressure in the well to be treated.

4,416,334

POTATO HARVESTING APPARATUS

Alain M. Bouillon, Minnesota Ave., North Greenbush, N.Y. 12144

Filed Sep. 28, 1982, Ser. No. 425,518
Int. Cl.³ A01D *17/06, 17/08*
U.S. Cl. 171—27 **8 Claims**



1. A potato harvesting apparatus for harvesting potatoes at maximum ground speed without regard to wet conditions, for removing during such harvesting operation practically all the dirt from the potatoes without bruising or otherwise damaging the potatoes, for separating the potato vines from the potatoes, for removing said separated potato vines and depositing same in the harvesting track and covering same with the dirt removed from the potatoes; said apparatus comprising a share, disk coulters, a cylindrical raker, primary, secondary and tertiary cylindrical cages, drive transmission means, shaker-tine means, a grinder suction fan and conductor pipe, cutting means and a conical cage; said share digging up the potatoes sufficiently for pick up by a first one of said primary cylindrical cages for transfer over to said primary, secondary and tertiary cylindrical cages, said cylindrical cages being in the harvesting flow of the potatoes and being arranged and disposed in ascending relationship to one another starting, in order, with said primary cylindrical cages and followed by said secondary

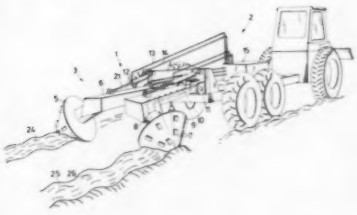
cylindrical cages and ending with said tertiary cylindrical cages, said disk coulters separating and cutting the vines between adjacent rows of potatoes, said cylindrical raker being arranged and disposed before and above said first one of said primary cylindrical cages to engage and pick up the excess of vines, dirt and potatoes that said first one of said primary cylindrical cages can not handle and to move such excess of vines, dirt and potatoes onto a second one of said primary cylindrical cages, the periphery of each of said cylindrical cages having a uniform diameter throughout, said drive transmission means being operatively connected with said cylindrical cages and causing all of said cylindrical cages to rotate in the same direction and at the same rate of material-flow delivery speed, said cylindrical cages engaging, picking up and transferring said potatoes and vines to said shaker-tine means for separating said potatoes from said vines, said shaker-tine means comprising a shaker-tine assembly having tines spaced apart to allow said potatoes to drop therethrough while retaining said vines thereon, said grinder suction fan being arranged and disposed above said shaker-tine assembly to suck up said vines, separated from said potatoes, remaining on said tines to grind said vines into little pieces and to conduct same through said conductor pipe and deposit same beneath said cylindrical cages in such harvesting track, said rotating cylindrical cages, while so engaging, picking up and transferring said potatoes and vines, engaging and removing the dirt from said potatoes, including breaking up dirt clods, and said cylindrical cages sifting the dirt removed from the harvested potatoes down and through said cylindrical cages to cover said little pieces of vines deposited in the harvesting track, said cutting means being arranged and disposed beneath said cylindrical cages to cut up any vines in the material flow that slip between said cylindrical cages, and said conical cage being arranged and disposed with respect to said shaker-tine assembly to receive and carry along through said conical cage without bruising same said potatoes separated from said vines.

4,416,335

GROUND-CLEARING AND MOUND-BUILDING SCARIFIER

Stig-Gunnar Lofgren, Jarved, and Bo G. Ekeborg, Bonassund, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Dec. 7, 1981, Ser. No. 328,309
Claims priority, application Sweden, Dec. 16, 1980, 8008842
Int. Cl.³ A01B *33/06, 49/04, 63/08, 63/111*
U.S. Cl. 172—2 **9 Claims**



1. A ground-clearing and mound-building device that can be towed along the ground to move material on the surface to one side, expose the surface of the ground, and build mounds on the cleared ground for planting and forest regeneration, comprising, in combination:

(1) a frame arranged to be attached to a vehicle above the ground;

(2) a scarifying means mounted on the frame for rotation abouts its central axis, circular in cross-section and having a peripheral surface that digs into the ground during rotation thereof when in contact with the ground under pressure;

(3) means for moving the scarifying means into and away from contact when the ground and arranged to bring the scarifying means into such contact with the ground at any of a plurality of selected contact pressures;

(4) drive means for rotating the scarifying means at a selected rotation rate; and

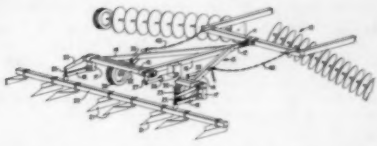
(5) means for controlling at least one of the selected contact pressure and the selected rotation rate to dig, loosen, and displace a surface layer of the ground and push such loosened ground into mounds.

4,416,336

TOOL BAR CARRIER WITH CASTERING WHEELS

Marlin W. Hohn, Rte. 1, Box 2C, Parkston, S. Dak. 57366

Filed Jan. 12, 1982, Ser. No. 338,988
Int. Cl.³ A01B *63/32;* **B60D** *1/00*
U.S. Cl. 172—386 **2 Claims**



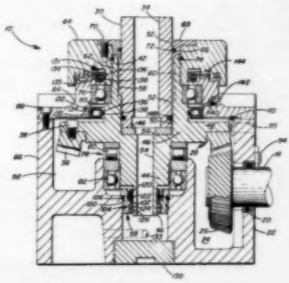
1. A tool bar carrier including a frame having a tongue at the front thereof adapted to be connected to a pulling device, tool bar means movably mounted on said frame opposite said tongue, means connected between said frame and said tool bar means by which said tool bar means can be lifted relative to said frame, wheel carrier means pivotally mounted on said frame and including axles, the axis of said axles being in a location to the rear of said pivotal mounting, wheels journalled on said axles and adapted to castor around said pivotal mounting, and flexible connecting means connected between said frame and said pulling device adapted to be adjustably shortened so that the position of said frame relative to said pulling device is flexible within limits prescribed by the length of said flexible means.

4,416,337

DRILL HEAD ASSEMBLY

Albert Phillips, 465 Kiwanis Ave.; Donald L. DeVall, 1082 Charles Ave.; Hu D. Devall, Rte. 1, Box 362A, all of Morgantown, W. Va. 26505

Continuation of Ser. No. 46,812, Jun. 8, 1979, abandoned. This application May 26, 1981, Ser. No. 267,090
Int. Cl.³ E21C *7/02*
U.S. Cl. 173—57 **5 Claims**



1. A drill head assembly comprising,

a drill housing having an internal cavity with an upper opening and a lower opening extending therethrough,

a rotatable drill retaining member positioned in said drill

housing internal cavity and extending through said upper opening,

said drill retaining member having a central bore therethrough,

a tubular member coaxially aligned with said drill retaining member, said tubular member having an internal bore for receiving said drill retaining member,

said tubular member internal bore extending axially through said drill housing internal cavity from said upper opening to said lower opening and adaptable for the conveyance of rock cuttings and dust therethrough,

means for nonrotatably connecting said drill retaining member to said tubular member in said internal bore thereof,

drive means positioned in said drill housing for rotating said tubular member,

said tubular member having an upper end portion and a lower end portion with an intermediate body portion positioned between said upper and lower end portions in said internal cavity, said tubular member upper and lower end portions being positioned oppositely of said internal cavity upper and lower openings respectively,

said drill retaining member being supported in said drill housing by said tubular member intermediate body portion to resist lateral thrust and thereby prevent lateral shifting movement of said drill retaining member in said drill housing,

said drill retaining member central bore and said tubular member internal bore being aligned to form a continuous passageway for the conveyance of rock cuttings and dust produced during the drilling operation from said internal cavity upper opening to said internal cavity lower opening and out of said drill housing,

said continuous passageway being subjected to a reduced pressure to evacuate said rock cuttings and dust out of said drill housing to a suitable collection point,

said tubular member lower end portion being positioned in said drill housing to form an annular space between said tubular member lower end portion and said drill housing adjacent said internal cavity lower opening,

a carrier member positioned in said annular space and nonrotatably connected to said drill housing, said carrier member including a body portion having an internal bore concentric with said annular space,

said carrier member internal bore including an enlarged diameter portion positioned above a reduced diameter portion with an inturned shoulder separating said enlarged diameter portion from said reduced diameter portion,

seal means positioned in said carrier member bore enlarged and reduced diameter portions between said tubular member lower end portion and said carrier member for sealing said annular space around said tubular member lower end portion in said drill housing,

said seal means including a plurality of annular seals positioned in overlying relation in said bore enlarged diameter portion, each of said annular seals including a sealing lip urged into sealing engagement with said tubular member lower end portion,

a pair of sealing rings positioned in overlying relation in said bore reduced diameter portion and sealingly engaging said tubular member lower end portion below said annular seals,

an upper shoulder extending outwardly from said carrier member body portion,

means positioned between said carrier member body portion and said drill housing below said shoulder for sealing around said carrier member to prevent the escape of lubricant from said drill housing internal cavity through said annular space,

dust evacuation means positioned below said carrier member and communicating with said continuous passageway through said drill retaining member and said tubular member for maintaining said annular seals removed from contact with the rock cuttings and dust by the evacuation thereof from said drill housing, and

said seal means being operable to prevent the escape of lubricant from said cavtiy through said annular space around said tubular member lower end portion and the entrance of foreign matter through said annular space into said cavity.

4,416,338

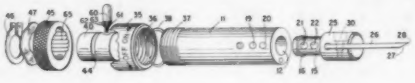
CONTROL MECHANISM FOR A PNEUMATIC TOOL

James W. Nelson, Union Grove; Raymond R. Zuzinec, and Michael L. Foster, both of Kenosha, all of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Jun. 25, 1981, Ser. No. 277,194

Int. Cl.³ B25D *17/00*

U.S. Cl. 173—134 **7 Claims**



1. In a pneumatic tool including a cylinder having a rear end and a front end, means for securing an implement to the cylinder at the front end, a piston in the cylinder adapted to be driven alternately forwardly and rearwardly by pressurized air, and control mechanism comprising a control body secured to the rear end of the cylinder, said body having an inlet for pressurized air and an outlet for regulated air directed toward the front end and a transverse opening communicating with said inlet and said outlet, a valve pin in said transverse opening and movable to a selected one of a plurality of positions between first and second extremes, the amount of air from said inlet to said outlet being a minimum in the first extreme and a maximum in the second extreme, means biasing said valve pin to one of the extremes, and control means for placing said valve pin in a selected one of the positions, said control means including a plurality of detent means engageable with said valve pin for retaining said control means in a condition corresponding to the selected position of said valve means.

4,416,339

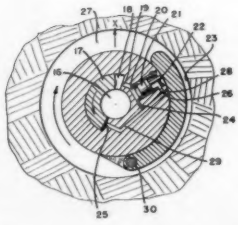
BIT GUIDANCE DEVICE AND METHOD

Royce E. Baker, P.O. Box 1377, Medina, Tex. 78055, and Glennwood Singletary, Rte. 6, Box 510, Hickory, N.C. 28601

Filed Jan. 21, 1982, Ser. No. 341,472

Int. Cl.³ E21B *7/04*

U.S. Cl. 175—61 **13 Claims**



1. A drill bit guidance device comprising: a collar member, a piston means, said piston means having a paddle member, said paddle member pivotably joined to said collar member, said collar member having a fluid conduit, said fluid conduit communicating with said piston means, a gate means, said gate means within said collar member, said gate means oscillatable around said fluid conduit, a fluid supply means, said fluid supply means communicating with said fluid conduit whereby said fluid from said supply means is directed through said fluid

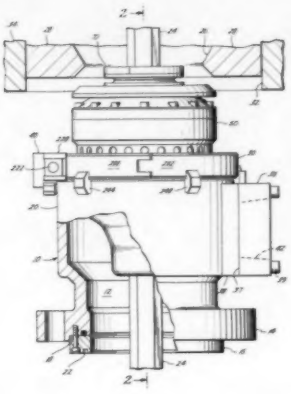
conduit to said gate means to allow said piston means to pivot said paddle member.

4,416,340

ROTARY DRILLING HEAD

Edmond I. Bailey, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Dec. 24, 1981, Ser. No. 334,372
Int. Cl.³ E21B 3/02
U.S. Cl. 175—195 11 Claims



1. A drilling head for attachment to a drilling control stack member, comprising:

a tubular body having a flow bore therethrough and a side bore;

a closure member cooperatively engaging said body around one end of said flow bore and having a bore adapted to receive a drive tube extending through said flow bore;

means for attaching the other end of said flow bore to the drilling control stack member;

securement means for releasably securing said closure member to said body, said securement means including a plurality of segments engageable with surfaces of said closure member and said tubular body, the juncture of said segments being hinged together excepting at one juncture joined by a variable length linkage;

said variable length linkage drawing said segments tightly around said closure member and tubular body for securing said member and body together and loosening said segments around said closure member and tubular member for unsecuring said member and body;

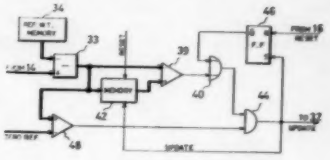
an impact motor for applying a variable torque to said variable length linkage for actuating said securement means, said impact motor imparting a continuous rotary motion to said variable length linkage for securing said member and body until the torque of said impact motor receives a predetermined resistance from said variable length linkage causing said impact motor to impart a series of rotary impact blows to said variable length linkage to tightly secure said segments around said member and body, said impact motor delivering a succession of rotational hammer blows to said variable length linkage to initiate the actuation of said variable length linkage for unsecuring said member and body and decreasing the torque applied to said variable length linkage until a smooth rotary motion is applied to unsecure said segments from around said member and body.

4,416,341

COMBINATION WEIGHING MACHINE

Takashi Hirano, Kobe, Japan, assignor to Yamato Scale Company, Ltd., Hyogo, Japan

Filed Nov. 23, 1981, Ser. No. 323,951
Claims priority, application Japan, Dec. 4, 1980, 55-171736; Mar. 11, 1981, 56-35629
Int. Cl.³ G01G 19/22
U.S. Cl. 177—25 7 Claims



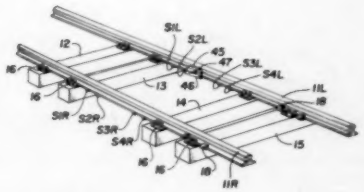
6. Apparatus for delivering quantities of a product with each quantity being of an acceptable totoal weight relative to a predetermined reference weight; comprising a plurality of weighing balances adapted to weight fractions of said quantity, respectively and for unloading of said product therefrom to collect them for delivery; means for generating the values of combinations of weights of said quantity fractions on the weighing balances; means for comparing said value of combinations of weights with said reference weight to select two values therefrom, one being greater than the nearest to said reference weight, and the other being less than and nearest to said reference weight; and means for comparing said selected two values with at least two ranges of weight having an order of priority and being preset about said reference weight, and means for unloading said product from the weighing balances contributing to the value which is in the range of weight of higher order of priority.

4,416,342

APPARATUS AND METHOD FOR WEIGHING ROLLING RAILCARS

Edwin D. Snead, Box 798, Georgetown, Tex. 78626

Continuation-in-part of Ser. No. 247,801, Mar. 26, 1981, abandoned. This application Jan. 4, 1982, Ser. No. 336,893
Int. Cl.³ G01G 21/22, 3/14
U.S. Cl. 177—163 28 Claims



1. A system for weighing railcars in motion comprising

a length of rail of generally uniform cross section supported at opposite ends in the manner of conventional rail; said length of rail including an unsupported section intermediate its ends, defining a weigh span; said weigh span having a length less than the minimum distance between adjacent axles of said railcars;

means mounted on said weigh span at four respective measuring points therealong for producing electric signals corresponding to the respective bending moments at said measuring points; said four measuring points comprising two pairs of points, each pair consisting of an outboard and inboard point, and each pair being disposed in a re-

spective half of said weigh span; the points of said pairs being spaced approximately the same distance from each other; means for summing the signals of said four signal producing means while a railroad axle moves between said two inboard measuring points.

4,416,343

ELECTROMECHANICAL WEIGHER

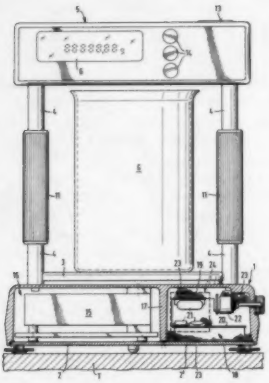
Erich Knothe, Bovenden; Dieter Blawert, and Bernd Schubart, both of Göttingen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 355,385

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 8114093[U]

Int. Cl.³ G01G *21/28*

U.S. Cl. 177—180 **9 Claims**



1. An electromechanical weigher to be used in areas subject to explosion hazards comprising:

an electro-mechanical weighing mechanism adapted and constructed to be explosion-proof by having the ratio of current intensity to wire cross section be so low that spark formation cannot occur and the heating of constituents on the basis of power loss of the electric system remains far below a critical ignition temperature of explosive material, wherever it is possible in the components of said mechanism to do so; and

a case for said mechanism adapted and constructed so that all components of said mechanism which cannot be explosion-proofed are enclosed in chambers which are filled with explosion-impeding granular material.

4,416,344

OUTRIGGERED VEHICLE CAPABLE OF CRABWISE TRANSLATION

Minoru Nakada, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 19, 1981, Ser. No. 275,297

Int. Cl.³ B62D *57/02*

U.S. Cl. 180—8 R **4 Claims**

1. A vehicle capable of crabwise translation, comprising:

a body having ground engaging means for longitudinal translation;

first and second pairs of extensible outrigger beams connected to the body, each outrigger beam extending generally transversely of the vehicle, each outrigger beam of each pair being spaced longitudinally of the vehicle;

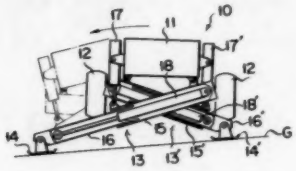
a set of lift cylinders co-acting with the pairs of outrigger beams for moving the body and the ground engaging means up and down with respect to the ground;

first and second pairs of extend cylinders mounted to the first and second pairs of outrigger beams, respectively, for independently extending and contracting the same;

a fluid circuit for independently actuating the set of lift cylinders, the first pair of extend cylinders, and the second pair of extend cylinders which comprises:

a source of fluid under pressure,

lift control valve means connected between the pressurized fluid source and the lift cylinders for controlling communication therebetween,



a first extend control valve between the pressurized fluid source and the first pair of extend cylinders for controlling communication therebetween, and

a second extend control valve between the pressurized fluid source and the second pair of extend cylinders for controlling communication therebetween;

whereby the vehicle can be shifted crabwise by selective actuation of the set of lift cylinders and the first and second pairs of extend cylinders.

4,416,345

ROTARY ASSISTANCE MECHANISMS, MORE ESPECIALLY FOR VEHICLE STEERING

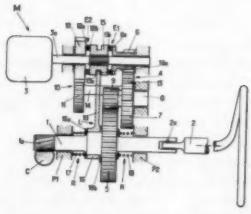
Andre Barthelemy, Saint-Remy-les Chevreuse, France, assignor to Automobiles Citroen and Automobiles Peugeot, both of Paris, France

Filed Oct. 26, 1981, Ser. No. 315,048

Claims priority, application France, Oct. 27, 1980, 80 22967

Int. Cl.³ B62D *5/04*

U.S. Cl. 180—79.1 **9 Claims**



1. A rotary assistance mechanism, adapted to be coupled to a rotatable driven member capable of turning in opposite directions in response to a torque applied by a rotating drive shaft, said rotary assistance mechanism comprising:

a motor with a rotatable output shaft;

a rotatable speed reducer mounted for transmitting rotation between said output shaft and said driven member, said speed reducer having at least one intermediate shaft so that when said speed reducer is driven by the motor, said driven member rotates in either of said opposite directions at a speed lower than the rotation speeds of the shafts formed by said motor output shaft and said at least one intermediate shaft;

a sliding part coaxial with said driven member, said sliding part being slidable in response to a torque transmittal to the driven member;

resilient means mounted to exert an action against sliding of said sliding part so that said sliding part may slide in relation to the amplitude and the direction of the torque applied by said drive shaft;

and at least one clutch mounted on one of said shafts which rotate faster than the driven member, said at least one clutch being actuated when said sliding part slides against said resilient means, whereby when said at least one clutch is actuated, said output shaft is coupled to said speed reducer so that rotation of the output shaft by said motor assists in the rotation of said driven member.

4,416,346

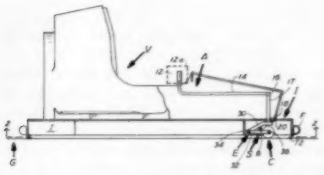
EXTENSIBLE STEERING, PROPULSION AND SKIRTING MEANS FOR GROUND EFFECT VEHICLES

Russell J. Logan, 2301 S. Millbend, Apt. 1007, The Woodlands, Tex. 77380

Filed Dec. 29, 1980, Ser. No. 220,505

Int. Cl.³ B60V *1/16*

U.S. Cl. 180—119 **1 Claim**



1. A skirt member for use with ground effect vehicles which employ a chamber for capturing pressurized fluid as a means for providing lift to the vehicle, and which hover above a support surface, comprising a resilient flap attached to and surrounding the outer periphery of the chamber, having a lip member forming a seal between the chamber and the support surface, wherein said flap is attached to said chamber by an attachment means comprising a flexible, inflatable hose which serves as a belt to releasably mount said resilient flap to the periphery of the chamber.

4,416,347

APPARATUS FOR PROPULSION CONTROL IN A MOTOR VEHICLE HAVING AN ANTI-LOCKING SYSTEM

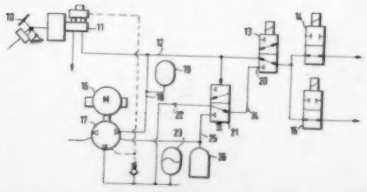
Hannes Bertling, Vaihingen, and Heinz Leiber, Leiman, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 1, 1981, Ser. No. 268,619

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1980, 3021116

Int. Cl.³ B60T *8/02*

U.S. Cl. 180—197 **14 Claims**



1. A brake apparatus for a motor vehicle having anti-skid regulation and regulation of the start-up slippage, including a brake pressure generator for supplying a pressure medium in a main line, a pressure source containing a pump, valve means actuatable by a control circuit in accordance with wheel movement behavior for blocking the supply of said pressure medium and for diverting said pressure medium into a return-flow line, a further valve for connecting said pressure source to wheel brakes of said motor vehicle, said control circuit actuating said valve means for the purpose of pressure regulation, said further valve being incorporated into said return-flow line for the purpose of feeding the pressure of said pressure source into said return-flow line and via said valve means into a wheel brake cylinder of a wheel exhibiting a start-up slippage.

4,416,348

COWLING FOR TRICYCLE VEHICLE

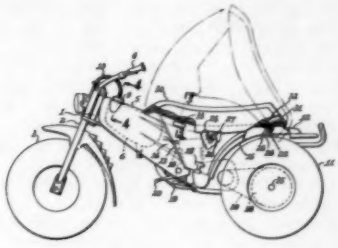
Takumi Fukui, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 5, 1980, Ser. No. 184,651

Claims priority, application Japan, Sep. 13, 1979, 54-117736

Int. Cl.³ B60J *1/04*

U.S. Cl. 180—210 **4 Claims**



1. A cowling for a tricycle vehicle of the type having a body, two rear wheels, one forward steerable wheel, a steering head pipe for steering said forward wheel, and an engine disposed forwardly of the rear wheels and rearwardly of the forward wheel, said cowling comprising: a front cowling member rearwardly of said steering head pipe, disposed so as to be grippable by the knees of the rider, a rear cowling member disposed rearwardly of said front cowling member, the front portion of the rear cowling member extending above the rear portion of the front cowling member, a seat on said rear cowling member; and a fuel tank mounted to said body forwardly of said seat and immediately rearwardly of said steering head pipe, said front cowling member covering said fuel tank, and said cowling members being detachably attached to said body.

4,416,349

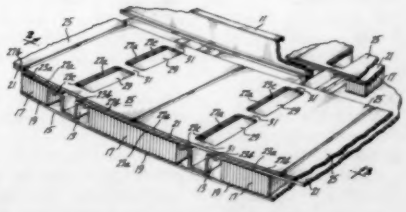
VISCOELASTICALLY DAMPED REINFORCED SKIN STRUCTURES

Loyd D. Jacobs, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1981, Ser. No. 306,951

Int. Cl.³ F16F *15/00*

U.S. Cl. 181—208 **6 Claims**



1. In a reinforced skin structure including a plurality of

frames, a plurality of spaced-apart stringers and a skin, said plurality of stringers being affixed to and supported by said plurality of frames, said skin being affixed to and supported by said plurality of stringers, said plurality of stringers having a U-shape with outwardly projecting flanges oriented such that said skin is affixed to the crossmembers of said U-shaped stringers and the flanges of said U-shaped stringers are affixed to said plurality of frames, the improvement comprising an integral damping mechanism, said integral damping mechanism comprising:

(A) core layers attached to said skin and located between adjacent pairs of spaced-apart stingers; and,

(B) viscoelastic coupling means for selectively attaching said core layers to said stringers, said viscoelastic coupling means comprising:

(1) a relatively stiff coupling comprising:

(a) a first panel comprising a plurality of sections, each of said first panel sections extending from the flange of one of said stringers to the flange of the next adjacent stringer so as to overlie the core layer lying between said adjacent stringers; and,

(b) a second panel comprising a plurality of sections, each of said second panel sections overlying an adjacent pair of first panel sections so as to span the area between the flanges of a U-shaped stringer;

(2) stringer/coupling viscoelastic layers for attaching said first panel sections to said stringers;

(3) core/coupling viscoelastic layers for attaching said first panel sections to said core layers; and

(4) panel/panel viscoelastic layers for attaching said second panel sections to said first panel sections.

4,416,350

MUFFLER

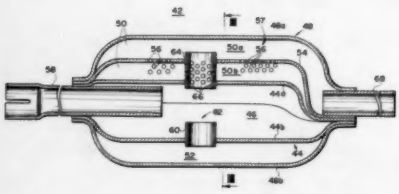
Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 11, 1982, Ser. No. 387,507

Claims priority, application Japan, Jun. 26, 1981, 56/100090

Int. Cl.³ F01N *1/08*

U.S. Cl. 181—272 **6 Claims**



1. A muffler comprising:

an inner shell having therein an expansion chamber;

an outer shell covering said inner shell to define a clearance therebetween, said inner shell being fixed to said outer shell to define a continuous line of contact therebetween thereby to divide the clearance into first and second cavity sections;

means connecting said expansion chamber to said first cavity section thereby allowing said first cavity section to show a sound damping effect;

an inlet pipe leading to said expansion chamber thereby introducing thereinto a gas issued from a noise source;

an outlet pipe extending from said first cavity section to the open air thereby discharging the gas, fed to the first cavity section through said means, into the open air.

4,416,351

REEL FOR A LIFE-LINE

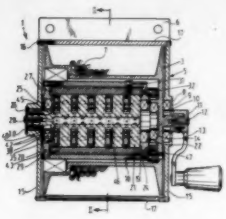
Alfonsus A. Geurtsen, Deventer, Netherlands, assignor to Machinefabriek Geurtsen Deventer B.V., Deventer, Netherlands

Filed Apr. 15, 1981, Ser. No. 254,215

Claims priority, application Netherlands, Apr. 29, 1980, 8002506; Nov. 5, 1980, 8006056

Int. Cl.³ A62B *1/12*

U.S. Cl. 182—238 **12 Claims**



1. A reel for a life-line comprising a frame, a winding member journalled in said frame so as to be rotatable about a rotary axis, damping means connected on the one hand with the frame and on the other hand with the winding member and counteracting the rotation of the winding member, said damping means comprising at least one cam member and a plurality of piston pumps rotatably co-operating herewith along a relative path of movement with respect to one another and each having a cylinder and a piston displaceable therein and being in contact with the cam member, whilst of each pair of pumps, whose pistons are moved in opposite senses by the cam member, the cylinders communicate with one another through a channel having a restriction, characterized by at least one set of pumps comprising a plurality of pump pairs which co-operate with the cam member along one and the same relative path of movement and which communicate each with a common channel portion through a restriction.

4,416,352

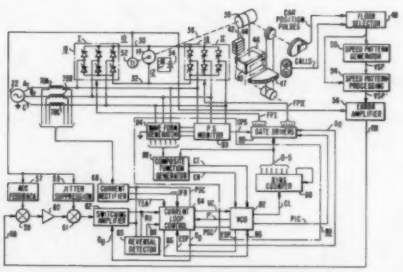
ELEVATOR SYSTEM

Alan L. Husson, Hackettstown, and Vladimir Uherek, Parsippany, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 17, 1982, Ser. No. 349,485

Int. Cl.³ B66B *1/30*; H02P *1/22*

U.S. Cl. 187—29 R **6 Claims**



1. An elevator system including an elevator car driven by a DC drive motor energized by dual converter means which switches from one converter bank to the other in response to a reference signal by retarding the firing angle of the gate drive pulses applied to the operative converter bank to a predetermined inversion end stop, applying the gate drive pulses to the

other converter bank, and advancing the firing angle thereof back towards rectification, the improvement comprising:

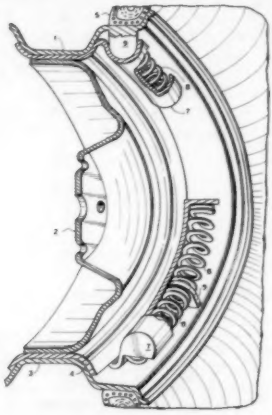
means responsive to the reference signal for selecting the rate, from at least first and second different rates, at which the firing angle of the gate drive pulses is advanced back towards rectification.

4,416,353

METHOD AND DEVICE FOR ACHIEVING AN ANTI-LOCKING EFFECT WHILE STOPPING THE WHEELS OF A VEHICLE

Vassil W. Ivanov, Sofia, Bulgaria, assignor to VMEI "Ienin", Sofia, Bulgaria

Filed May 21, 1981, Ser. No. 266,101
Int. Cl.³ B60T *1/06*
U.S. Cl. 188—2 A **5 Claims**



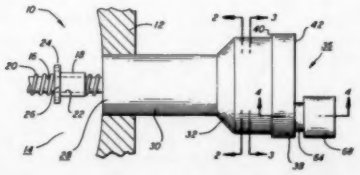
2. An anti-brake-locking device for the wheel of a vehicle, the wheel being carried by a hub, the hub having a braked member secured to the wheel, the improvement wherein the braked member and the wheel are mounted for limited rotational movement with respect to each other and comprising elastic elements interposed between the braked member and the wheel, such elastic elements while the brakes are locked constantly urging the braked member and the wheel to rotate relative to each other into a central, neutral position.

4,416,354

ROTARY FEEDTHRU CONTROL

David Seibel, Lakeville, Minn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 1, 1981, Ser. No. 279,413
Int. Cl.³ G05G *5/06*
U.S. Cl. 188—166 **6 Claims**



1. A mechanism for controlling an ultra-high vacuum rotary feedthru, said mechanism comprising:

a rotatable shaft;

a brake drum extending around said shaft and coaxial therewith;

a carrier plate affixed to said shaft; said carrier plate having at least one carrier block associated therewith;

at least one brake shoe pivotably affixed to said carrier block and spaced apart from said carrier plate thereby; and

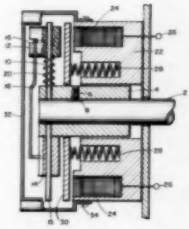
means for moving said brake shoe between a first position, whereat said brake shoe applies, via a biassing means, a frictional force against said drum thereby preventing movement of said carrier plate, and a second position, whereat said brake shoe is spaced apart from said drum thereby permitting rotation of said carrier plate, said moving means including a wedge affixed to a pressure rod eccentric with respect to said rotatability, said wedge being so positioned that upon the urging of said rod, said wedge pivots said brake shoe, against said biassing means, from said first position to said second position.

4,416,355

CENTRIFUGALLY CONTROLLED DIFFERENTIAL TAPE REEL BRAKE

Herbert F. Sanford, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 334,777, Dec. 28, 1981. This application Mar. 21, 1983, Ser. No. 477,284
Int. Cl.³ B65H *23/06*; B60T *13/06*
U.S. Cl. 188—185 **20 Claims**



14. A brake comprising

an input shaft means for connecting the brake to a rotating device to be braked,

brake pad means,

support means attached to said shaft for slideably supporting said brake pad means between a first and a second radial position with respect to said shaft,

braking surface means in contact with said brake pad means for braking said shaft means and

centrifugally actuated means connected to said brake pad means and said shaft means to control the radial position of the brake pad means inversely dependent on the angular velocity of said shaft means to provide variable braking torque.

4,416,356

HYDRAULIC WHEEL CYLINDER ASSEMBLIES AND DRUM BRAKES INCORPORATING SAME

Duncan W. Osborne, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Sep. 16, 1981, Ser. No. 302,530
Claims priority, application United Kingdom, Sep. 27, 1980, 8031307
Int. Cl.³ F16D *65/24*
U.S. Cl. 188—326 **12 Claims**

1. A hydraulic wheel cylinder assembly for an internal shoe drum brake, the wheel cylinder assembly comprising:

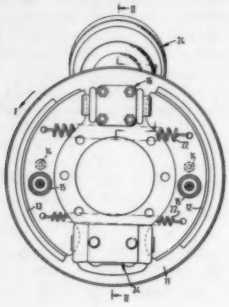
a cylinder body having a through bore therein;

a pair of piston assemblies slidable in said bore;

an inlet port in the cylinder body which opens into said bore for supplying hydraulic pressure to urge the piston assemblies away from each other;

an automatically adjustable variable length tappet assembly incorporated in each piston assembly, each tappet assembly comprising a rotatable screw-threaded component interengaged with a non-rotatable screw-threaded component;

a one-way drive mechanism associated with each tappet assembly and comprising a driven member which is rotationally fast with the rotatable screw-threaded component



and a driving member which is rotationally fast with the cylinder body;

a spring connection between the driven member and the rotatable screw-threaded component allowing relative axial movement therewith;

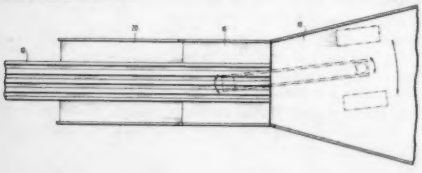
and stop means on the driven member for limiting movement of the driven member in the direction of the other piston assembly, the arrangement being such that the spring connection yields during continuing movement of the screw-threaded components in the direction of the other piston assembly when the driven member is arrested by said stop means.

4,416,357

GUIDE STRUCTURE FOR TROLLEY RAIL AND FLYING PICKUP

John A. Szysh, P.O. Box 309, York, Pa. 17405

Filed Aug. 28, 1981, Ser. No. 297,318
Int. Cl.³ B60M *1/34*
U.S. Cl. 191—23 A **4 Claims**



1. In combination with a substantially horizontal, overhead trolley rail housing having a plurality of parallel open bottom slots extending lengthwise of the housing;

a plurality of electric rail conductors, one mounted up in each said slot respectively and providing a downwardly facing, collector-contacting, rail surface;

a trolley unit, carried by a vehicle which unit may be of the order of 60 feet vertically above the vehicle operator, said unit having anumber of contact shoes equal to the number of said conductors and being adapted to engage therewith, to be removed therefrom and returned thereto, said unit permitting both lateral and vertical movement with respect to said housing and including means for biasing said contact shoes into engagement with said downwardly facing surface of said conductors;

inverted channel shaped guide means for automatically aligning the contact shoes carried by said trolley with said rails, said guide means including an approach section extending from one end of said housing, sloping upwardly therefrom and diverging horizontally widely outwardly of said housing, a central section, and an exit section sloping upwardly from said central section toward said rails, the horizontal dimension of the channel of said central and exit sections being such that said trolley when travelling therethrough has said contact shoes accurately horizontally aligned with said rails, the horizontal portion of said central section being vertically positioned so that when said trolley is within said section, said contact shoes are spaced below said rails;

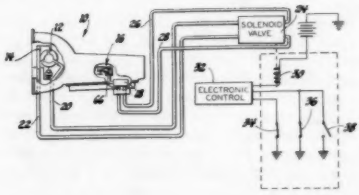
whereby positioning of the trolley in said approach section and advancing it successively through all three sections is effective first to align said contact shoes horizontally with the rails and simultaneously space said contact shoes below the level of the rails and then permit the trolley to rise vertically while maintaining horizontal alignment until said contact shoes smoothly and accurately engage with the undersurface of the rails.

4,416,358

ELECTRO-HYDRAULIC CONTROL FOR A TRANSMISSION HAVING A TORQUE CONVERTER CLUTCH

Gerald E. Kapp, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 21, 1981, Ser. No. 265,834
Int. Cl.³ B60K *41/22*; F16D *25/10*
U.S. Cl. 192—3.32 **2 Claims**



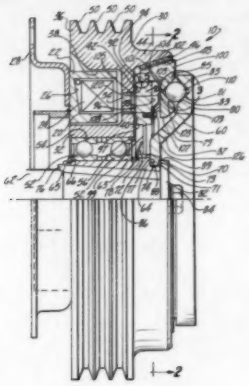
1. A control for a multispeed ratio automatic shifting transmission having a torque converter and a selectively engageable clutch for bypassing the torque converter, said control comprising; a pressure passage; shift valve means selectively operable for providing a ratio interchange between a high speed ratio and a low speed ratio including passage means connected to means for establishing said high speed ratio, a restriction in the passage means, an exhaust passage and a slidable valve member operable to selectively connect said passage means to said pressure passage to establish the high speed ratio or to said exhaust passage when the low speed ratio is established; electric switch means responsive to the pressure in said passage means between said valve member and said restriction for actuation when said passage means is pressurized and deactuation when said passage means is exhausted; and means for controlling the engagement and disengagement of the selectively engageable clutch and being responsive to actuation or deactuation of said electric switch means to momentarily disengage said clutch when said passage means is pressurized to establish the higher ratio or exhausted to disestablish the higher ratio.

4,416,359

ELECTROMAGNETIC CONE CLUTCH WITH BALL TORQUE BOOSTER

Donald L. Miller, Horseheads, N.Y., assignor to Facet Enterprises, Incorporated, Tulsa, Okla.

Filed Mar. 23, 1981, Ser. No. 246,538
Int. Cl.³ F16D 13/75, 27/10
U.S. Cl. 192—54 11 Claims



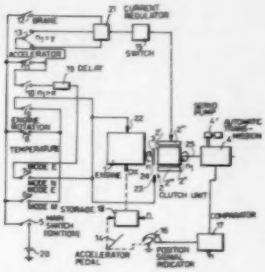
1. A torque transmitting device comprising:
output means; and
input means, coaxially disposed with said output means, said input means further comprising:
an annular magnetic armature having a threaded outer diameter;
an annular adjustable friction ring member threadably mounted on said threaded outer diameter of said annular magnetic armature for relative motion therewith;
a drive plate member coaxially disposed with said annular magnetic armature, said drive plate member further being mounted adjacent to said annular magnetic armature; and
means for translating torque from said drive plate member to said annular adjustable friction ring member, said translating means further comprising:
a plurality of spherical members interposed said annular adjustable friction ring member and said drive plate member, said plurality of spherical members adapted to simultaneously engage said drive plate member and said annular adjustable friction ring member to provide direct torque transmission to said output means; and
clutch actuating means, for actuating said torque translating means, said clutch actuating means producing a circuitous flux path through said output means and said annular magnetic armature so as to transmit torque through said drive plate member, through said plurality of spherical members, and through said annular adjustable friction ring member to said output means, said clutch actuating means further comprising:
electromagnetic means, mounted adjacent said output means, for producing a circuitous magnetic flux path when energized.

4,416,360

DRIVE FOR AUTOMOBILE AUTOMATIC TRANSMISSION

Ernst Fiala, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Sep. 26, 1980, Ser. No. 191,079
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943563
Int. Cl.³ B60K 41/02
U.S. Cl. 192—0.076 10 Claims



1. A vehicle drive train, comprising an internal combustion engine having an output shaft, an automatic transmission having an input shaft, a drive-up motor of a noncombustion type being in torque-transmitting connection with said input shaft, a clutch between said output shaft and said drive-up motor having an engine-side part and a transmission-side part, a flywheel, and control means responsive to flywheel speed for controlling clutch engagement, said transmission being of the type automatically shifting between stages upon receiving shifting signals, said flywheel being permanently connected with said transmission-side clutch part, said flywheel, clutch and drive-up motor replacing a hydrodynamic torque converter, and said control means permitting engagement of said clutch only when an accelerator lever is actuated and flywheel speed is above a predetermined value.

4,416,361

FRICTION FACINGS REINFORCED WITH STITCHING

Kiyohisa Suzuki, Toyota; Yasunobu Yamamoto, Chiryu; Ryoichi Tomikawa, Toyota; Toshiaki Sakabe, Toyota; Hiroshi Ban, Toyota, and Nobuyasu Ishida, Tokai, all of Japan, assignors to Aisin Seiki Co., Ltd., Kariya, Japan

Continuation of Ser. No. 132,425, Mar. 21, 1980, abandoned.
This application Dec. 23, 1981, Ser. No. 333,771
Claims priority, application Japan, Mar. 30, 1979, 54-38847
Int. Cl.³ F16D 69/02
U.S. Cl. 192—107 M 9 Claims

1. A friction facing comprising a non-woven fibrous lamina, reinforced with stitches of a continuous brass wire, which has been impregnated with a binder, wherein said friction facing is attached to a clutch mechanism.

4,416,362

MATERIAL DISCHARGE APPARATUS WITH IMPROVED DISCHARGE TUBE

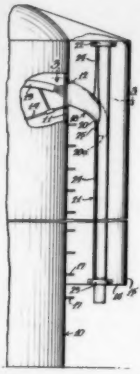
Harold J. Kilts, Middleton, and Laurence J. Swaziek, Madison, both of Wis., assignors to Madison Farm Structures, Inc., Madison, Wis.

Filed Jul. 31, 1981, Ser. No. 288,946
Int. Cl.³ B65G 11/10
U.S. Cl. 193—25 C 10 Claims

1. In apparatus for delivering material from a mass of material stored in a silo which has a vertical series of doorways, said material being removed from the top of the mass and dis-

charged through the one of said series of doorways which is nearest above the top of the mass into a chute on the silo, which apparatus includes a transfer conduit adapted to be mounted in said one of said series of doorways to receive discharged material and having an outer end portion with an open end to direct said material into a tube through which it is delivered to the lower end of the chute, the improvement comprising:

an upright flexible tube which is open at the bottom and has a continuous upright slit extending substantially from top to bottom thereof;



first means fixedly securing the top of said flexible tube in the chute near the top of the uppermost silo doorway;

second means fixedly securing the bottom of said flexible tube in the chute near the bottom of the chute; and

fastener means which closes said slit and which may be selectively opened to admit the open end of the transfer conduit to the flexible tube at any desired level while retaining said slit closed below said open end whereby the transfer conduit may be mounted in any one of said series of doorways and direct material into the tube at said desired level while the entire tube remains fixedly secured in the chute.

4,416,363

VENDING MACHINE WITH SEPARATE INTERLOCKING SECTIONS

Sven Stork, Siegen, Fed. Rep. of Germany, assignor to Electrolux Siegen GmbH, Siegen, Fed. Rep. of Germany

Filed Jul. 3, 1980, Ser. No. 165,751

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1979, 2927696

Int. Cl.³ G07F 7/02, 11/62

U.S. Cl. 194—4 D **7 Claims**

1. In a vending machine comprising,

a housing,

separate lockable sections disposed in said housing, each of said sections being divided into rows for holding articles to be dispensed, and provided with locking elements,

lever means for locking and unlocking of the locking elements of said lockable sections,

a stamping mechanism which includes a number of stamping punches corresponding to the number of said sections in the machine and being operable individually by pivoting of respective locking elements,

an interlocking device operatively connected to the lever means to cause the same to selectively engage the locking elements, and

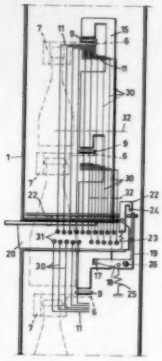
an actuating key inserted into a correspondingly shaped openings in said housing for actuating the interlocking device and unlocking the locking elements of said sections, said actuating key including a matrix for the stamping punches, subdivided into fields,

the improvement which comprises:

a plurality of push rods being formed of a narrow sheet metal web, and arranged one above another in said housing so as to be movable longitudinally therein, said push rods engaging the stamping mechanism in response to withdrawal of an article from the vending machine,

the locking elements being formed of locking hooks pivotally mounted on said push rods,

the lever means including a guide rail member for engaging the locking elements,



the interlocking device comprising a vertical locking bar for engaging said guide rail member, an angular lever which engages said vertical locking bar, and at least one spring biased anti-theft plate actuated by said actuating key to pivot against the force of the spring relative to said vertical locking bar, and disengage the angular lever, and

said actuating key which acts on said anti-theft plate comprising a housing having orifices disposed on one side thereof and an interchangeable stamping matrix disposed therewithin.

4,416,364

COIN VALIDATING ARRANGEMENT

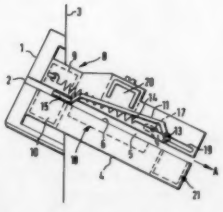
Robert D. Bellis, near Oldham, and Dennis Wood, Denshaw, both of England, assignors to Coin Controls Limited, Royton, England

Filed Nov. 28, 1980, Ser. No. 211,128

Claims priority, application United Kingdom, Dec. 4, 1979, 7941789

Int. Cl.³ G07D 5/08

U.S. Cl. 194—100 A **32 Claims**



23. A coin validating arrangement comprising a coin receiving slot opening into a coin guide path, an obturator, means mounting the obturator in a blocking position obstructing

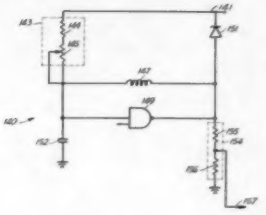
passage of all coins inserted in the slot, coin validating means positioned to sense the validity of a coin currently obstructed by the obturator, and means whereby the obturator is moved out of the blocking position to allow passage of a coin which has been validated by the validating means, the obturator being mounted to return along the coin path and re-present all non-validated coins at the coin receiving slot.

4,416,365

COIN EXAMINATION APPARATUS EMPLOYING AN RL RELAXATION OSCILLATOR

Frederic P. Heiman, Philadelphia, Pa., assignor to Mars, Inc., McLean, Va.

Filed Aug. 21, 1981, Ser. No. 295,139
Int. Cl.³ G07D 5/08
U.S. Cl. 194—100 A **9 Claims**



1. A coin testing apparatus comprising means to subject a coin to an electromagnetic field and to produce a digital signal indicative of the degree of interaction of the coin with the field, and means to determine whether said signal corresponds to that for an acceptable coin, wherein said means to subject a coin to an electromagnetic field and to produce a digital signal comprises a coin passageway and a resistor-inductor type relaxation oscillator having an oscillation frequency determining inductor adjacent the coin passageway, the inductor producing the electromagnetic field in the coin passageway, said resistor-inductor relaxation oscillator having a substantially linear frequency change with respect to change in the effective inductance in the oscillator over a range of inductance suitable for testing coins and producing an output signal which is digital in nature and requires no amplitude discrimination or shaping to be suitable for counting, and said means to determine whether said signal corresponds to that for an acceptable coin comprises counting means for counting the digital output signal.

4,416,366

EMERGENCY STOP MECHANISM

Michael Maryonovich, Whitefish Bay, and Edward Ebey, Nashotah, both of Wis., assignors to Masco Corporation, Taylor, Mich.

Continuation-in-part of Ser. No. 201,507, Oct. 23, 1980, Pat. No. 4,359,207. This application Mar. 11, 1981, Ser. No. 242,687
Int. Cl.³ B65G 41/00
U.S. Cl. 198—320 **9 Claims**

1. A grain handling apparatus including an elongated carrier, and a lifting device for raising one end of said carrier, said lifting device including a trolley upon which said carrier partly rests, a first and second link pivotally connected together, said first link being fastened to said carrier, said second link being connected to said trolley, a primary cable and reel means operative to play out and take up said cable, said cable being fastened to said trolley and exerting a force on said trolley along a path on the underside of said carrier in a direction of increased potential energy upon being taken up by said reel, and a stop mechanism, said stop mechanism comprising:

a secondary cable fastened at each of its ends to said carrier at fastening points beyond said path and extended parallel to said path;

a stationary jaw fixedly fastened to said carrier and disposed adjacent said secondary cable;

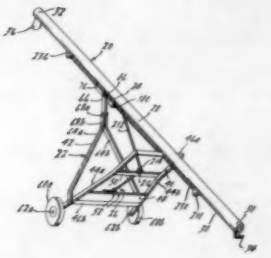
a movable jaw movably fastened to said trolley such that said movable jaw is selectively movable into contact with said secondary cable to grip said secondary cable between said jaws and thereby prohibits motion of said carrier along said path;

biasing means biasing said movable jaw towards said secondary cable and said stationary jaw;

retracting means fastened to said primary cable and movably fastened to said trolley;

said retracting means includes a lever pivotably connected to said trolley with one end in engagement with a stop means fastened to said primary cable;

said lever having a second end in engagement with said movable jaw;



said retracting means constructed to respond to the magnitude of tension along said primary cable with said tension being transmitted to said stop means, said lever, said movable jaw, and said biasing means such that said retracting means has its lever pivoted to a first position and moves said movable jaw away from said secondary cable against the force of said biasing means when an amount of tension is in excess of a predetermined minimum value, said biasing means moving said movable jaw to grip said, secondary cable and pivoting said lever to a second position upon a decrease in tension in said primary cable below said predetermined minimum, and said lever again retracting said movable jaw upon a later increase in tension above said predetermined minimum, said predetermined minimum amount of tension being less than the amount of tension in said line required to maintain the position of said trolley.

4,416,367

TROLLEY AND CHAIN CLEANER

Richard L. Easton, Rives Junction, and Richard H. Friedlund, Jackson, both of Mich., assignors to LubeCon Maintenance Systems, Inc., Fremont, Mich.

Filed Aug. 28, 1981, Ser. No. 297,099
Int. Cl.³ B65G 45/00
U.S. Cl. 198—496 **6 Claims**

1. A trolley and chain cleaner combination for conveyors and the like comprising:

a mounting bracket adapted to be secured to a conveyor track;

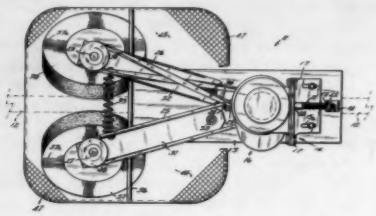
a motor on said bracket;

a pair of brushes;

hubs through said brushes askew to the plane of said brushes;

support means for said hubs and brushes and having arms

movable on a common pivot and operably secured to said bracket;



drive means connected to each of said brushes and said motor; and

resilient means urging said brushes toward each other.

4,416,368

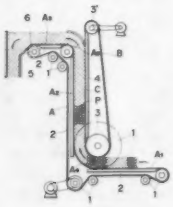
CONVEYOR MECHANISM FOR CYLINDRICAL ARTICLES

Tsuyoshi Muramatsu, and Shuji Hara, both of Hiratsuka, Japan, assignors to The Japan Tobacco & Salt Public Corporation, Hiratsuka, Japan

Continuation of Ser. No. 220,185, Dec. 23, 1980, abandoned, which is a continuation of Ser. No. 49,224, Jun. 18, 1979, abandoned. This application Jul. 20, 1982, Ser. No. 400,055

Int. Cl.³ B65G *15/14*

U.S. Cl. 198—604 **11 Claims**



1. A conveyor mechanism for transferring cylindrical articles, such as cigarettes, from the lower level to a higher level and through a concavity passage area including:

an endless backing conveyor belt;

an upper pulley and a lower pulley supporting said endless backing conveyor belt;

an endless conveyor belt forming a first plane section extending from about said lower pulley, and a second plane section extending between said lower and upper pulleys in confronting relation to said endless backing conveyor belt;

a plurality of spaced cylindrical support members transversely extending within said endless conveyor belt perpendicularly to an intended direction of conveyance and projecting from only one side of said endless conveyor belt;

at least one endless chain extending substantially parallel with said endless conveyor belt on said only one side thereof while retaining said spaced cylindrical support members;

first chain holding means for supporting said at least one endless chain on said only one side of the endless conveyor belt;

and second chain holding means for reducing belt slack including a sprocket wheel provided on said only one side of the endless conveyor belt coaxially with said lower pulley and having a diameter larger than that of said lower pulley to support said at least one endless chain such that said endless conveyor belt forms a smooth curved transitional section between said first plane section and said second plane section;

whereby safe and easy access to articles in conveyance is provided in case of mechanical breakdown from the other side of said endless conveyor belt unobstructed by said at least one endless chain and said chain holding means which permits one to reach for the articles on the conveyor belt without fear of one's hands being caught between said endless conveyor belt and the sprocket arrangement; and whereby the surface of the conveyor belt is precluded from floating in said concavity passage area by the said at least one endless chain and sprocket arrangement.

4,416,369

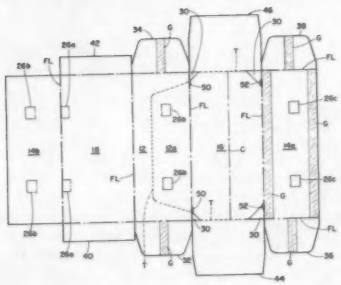
DISPLAY AND DISPENSING CARTON

Edward P. Burns, Cos Cob, Conn., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jan. 11, 1982, Ser. No. 338,681

Int. Cl.³ B65D *5/64*

U.S. Cl. 206—45.29 **9 Claims**



1. A combination shipping and display carton having a first carton blank configuration, a second shipping configuration and a third display configuration, said carton comprising:

(a) in said first configuration a single unitary blank, said blank having:

(i) first and second rear wall panels formed as the opposite ends of the unitary blank, with at least one adhesive means formed on at least one of the rear wall panels,

(ii) a front wall panel having a bottom panel and a top panel on opposite sides thereof, said front, top and bottom panels joining said first and second rear wall panels,

(iii) a plurality of first and second end panels attached to at least one of the rear, front, top and bottom wall panels with a second adhesive means formed on at least one of each of said first and second end panels,

(iv) said blank being formed with a tear line parallel to the end panels across the top panel and extending across the front panel to traverse the panel from said frist end to said second end, said top panel having a transverse crease line formed therein,

(v) one side of said blank providing space for printed advertising matter to be used in said second and third configurations,

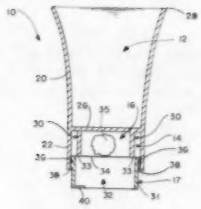
(b) in said second configuration, a closed shipping carton, said carton having;

(i) said first and second rear wall panels joined together by said first adhesive means to define a rectangular enclosure with said space for said printed advertising matter on the outside thereof,

(ii) said end panels being secured together by the second adhesive means to form a closed shipping carton,

(c) in said third display configuration, said carton having:
(i) said front and top panels being severed along said tear line,
(ii) said top panel being folded along said crease line,
(iii) said front panel and said top panel being adjacent to and reinforcing said rear wall panel, said upstanding front and top folded configuration providing a display panel for said printed advertising matter.

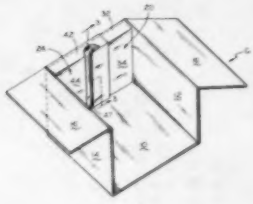
4,416,370
COMPARTMENTED CONTAINER
Robert Beall, 11 Heather La., Columbia, Mo. 65201
Filed Aug. 25, 1982, Ser. No. 411,452
Int. Cl.³ B65D *85/00, 77/40, 3/24*
U.S. Cl. 206—217 **17 Claims**



1. A compartmented container adaptable for holding a liquid and a non-liquid substance therein comprising a body member having a first substantially cup-like portion for holding the liquid substance therein and a second portion defining a second compartment for holding the non-liquid substance therein, said body member having first and second ends and a closed side wall portion extending therebetween, a floor member disposed at an intermediate location along the closed side wall portion separating the cup-like portion from said second compartment, a closed wall member extending from said floor member into said second compartment forming a cavity therewithin adaptable to receive the non-liquid substance therein, said closed wall member being positioned in spaced relation inwardly from the closed side wall portion of said body member to form a space therebetween, a closure member slidably receivable within said second compartment including a closed wall member shaped to be movable in the space between the closed side wall portion of said body member and the closed wall member forming said cavity, said closure member having a rupturable membrane extending thereacross adjacent one end thereof whereby said membrane can be moved against the cavity forming wall member to rupture said membrane and provide access to the non-liquid substance stored in said cavity.

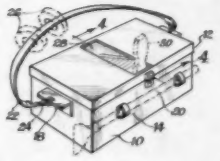
4,416,371
GARMENT CONTAINER
James F. Nauheimer, Chicago, Ill., assignor to Container Corporation of America, Chicago, Ill.
Filed Mar. 12, 1982, Ser. No. 357,633
Int. Cl.³ B65D *85/18*
U.S. Cl. 206—289 **3 Claims**

1. In a collapsible container adapted to hold a plurality of garments on hangers, formed from a unitary blank of foldable sheet material, such as paperboard, and being self-contained so as to require no outside securing means to maintain it in erected position, the combination of:
(a) a bottom wall panel having pairs of opposed side and end walls foldably joined thereto and to each other and upstanding therefrom to form a boxlike structure;
(b) at least one of said end walls including a pair of hollow sections extending toward each other for opposed side walls in partially overlapping, telescoping relation;
(c) each of said hollow sections including:
(i) an outer panel foldably joined to an adjacent end edge of a related side wall panel;
(ii) an upper panel foldably joined to an upper edge of said outer panel and extending inwardly therefrom;
(iii) an inner panel foldably joined to an inner edge of said upper panel and extending downwardly therefrom;
(iv) a bottom flange foldably joined to a lower edge of the inner panel and extending outwardly therefrom over the bottom wall panel;



(d) the upper and inner panels of said sections having aligned hanger receiving openings therein;
(e) said sections having interlocking engagement with each other to maintain said container in erected position without requiring outside securing means; and
(f) one of the bottom flanges of said sections having a locking tab and the other bottom flange of said sections having a slot, said slot being adapted to receive said locking tab to provide a locking engagement.

4,416,372
DRYWALLER'S TOOL BOX
Gary L. Polk, 10369 Gold Coast Pl., San Diego, Calif. 92126
Filed Sep. 29, 1982, Ser. No. 427,390
Int. Cl.³ B65D *85/28*
U.S. Cl. 206—372 **9 Claims**

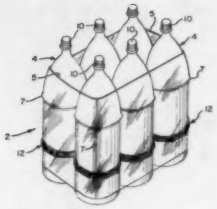


1. A drywaller hanger's tool kit comprising:
(a) a case;
(b) a blade-holding rack defining a plurality of parallel vertical slots;
(c) said rack having converging sidewalls such that the width of said slots progressively decrease from a widest slot to a narrowest slot; and
(d) a lid for said case having a blade handle clearance cutout spanning said slots centrally and perpendicular thereto, such that a plurality of drywall paste applicator blades of decreasing blade width can be stored in the respective decreasing-width slots of said rack with the handles of said blades extending through said cutout when said lid is on said case.

4,416,373
INTERLOCKING STACKABLE BOTTLES

Pierre J. deLarosiere, 30 Rua D. Palmela, Lisbon, Portugal

Filed Feb. 4, 1982, Ser. No. 345,684
Int. Cl.[3] B65D *65/00, 85/62, 21/02*
U.S. Cl. 206—432 4 Claims



1. In a bottle of the type having:

(a) a liquid container made of a plastic material, the container being generally symmetric in shape about a symmetry axis and having a container opening in it for filling and discharging liquid, the container opening being located so that the symmetry axis passes centrally through the opening;

(b) a top closure for sealing the container opening; and

(c) a base cup joined to the liquid container at an end of the container generally opposite to the container opening, the base cup being made of a plastic material and being shaped to permit the bottle to stand upright on a horizontal surface with the symmetry axis of the container extending in a substantially vertical direction, a bottle-rest reference surface being defined to be a plane tangent to the points of the base cup on which the base cup rests when the bottle is standing upright on a horizontal surface;

the improvement which comprises:

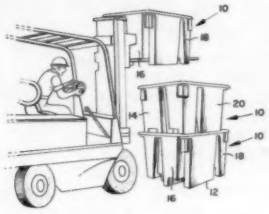
(i) a base-cup interlock band joined to the base cup, the interlock band extending generally parallel to the bottle-rest reference plane and around an outer surface of the base cup, the interlock band including a plurality of interlock band segments, each interlock band segment corresponding to a side of a reference equilateral polygon defined to be lying in the reference plane and centered on the symmetry axis, the number of interlock band segments being equal to four times an integer greater than one, an outwardly facing surface of each interlock band segment defining an interlock facet, each interlock facet extending in a direction generally parallel to the corresponding side of the reference polygon and in a direction generally parallel to the symmetry axis, an intersection between each pair of adjacent interlock-band segments being generally rounded, each interlock facet having a plurality of grooves passing through it extending generally parallel to the symmetry axis of the liquid container to define vertical facet grooves, the width of the vertical facet grooves being greater than the spacing between adjacent grooves to permit the vertical facet grooves of two facets on different bottles to mesh, each pair of adjacent facets having a plurality of grooves extending generally parallel to the reference plane to define horizontal facet grooves, the horizontal facet grooves extending between a first vertical facet groove located on a first facet of a pair of adjacent facets and closest to a second facet of the pair and a second vertical groove located on the second facet and closest to the first facet, the width of the horizontal facet grooves being greater than the spacing between adjacent grooves and the spacing between boundaries of the facet and horizontal facet grooves adjacent to the boundaries to permit the horizontal grooves of two facets of the different bottles to mesh, the horizontal and vertical grooves of the interlock facets thereby cooperating to prevent bottles from moving relative to one another in two directions when the bottles are placed in alignment facet-to-facet with facet grooves engaged; and

(ii) a bottle-stacking support connected to the base cup and abutting a base portion of the liquid container, the bottle-stacking support being located symmetrically with respect to the symmetry axis of the liquid container and spaced apart from the bottle-rest reference plane, the base cup being shaped to define a closure guide which opens from the bottle-stacking support to the bottle-rest reference plane, the closure guide being shaped to receive the top of a closure of a second bottle whose symmetry axis is generally colinear with the symmetry axis of the bottle having the bottle-stacking support and to guide the closure top to the bottle-stacking support, the bottle-stacking support being adapted to transmit the weight of the bottle having the bottle-stacking support to the top of the closure of the second bottle.

4,416,374
NEST AND STACK CONTAINER

Rush B. Smith, Philadelphia, and Pasquale C. Daloisio, New Hope, both of Pa., assignors to Pennsylvania Pacific Corporation, Warminster, Pa.

Filed Apr. 16, 1982, Ser. No. 368,917
Int. Cl.[3] B65D *21/04*
U.S. Cl. 206—507 2 Claims



1. A lidless open-stacking seamless plastic container comprising,

a bottom and four upwardly extending walls, said walls comprising a front wall, a rear wall, a right wall and a left wall,

said bottom including five downwardly extending legs forming supporting members for the container, a center leg extending somewhat off-center between said front and rear walls, extending in end-to-end relation adjacent said right wall between said front wall and said rear wall with a right wall gap between them, front and rear left wall legs extending in end-to-end relation adjacent said left wall between said front wall and said rear wall with a left wall gap between them, said right wall gap being closer to said front wall than said left wall gap, channels formed between said center leg and said right and left wall legs, and extending between said front and rear walls for the entry of the tines of a forklift truck, and

said walls including a plurality of depressions, said depressions forming stacking lugs internally of the container with a front wall stacking lug adjacent said front wall substantially centrally thereof, a right wall stacking lug adjacent said right wall, a left wall stacking lug adjacent said left wall, a rear wall stacking lug adjacent said rear wall somewhat off center thereof toward said left wall, said right wall stacking lug being closer to said front wall than said left wall stacking lug, a right rear corner stacking lug adjacent said rear wall near said right wall and a left rear corner stacking lug adjacent said rear wall near said left wall, each of said stacking lugs having an upper stacking surface,

said front, rear, right and left wall stacking lugs having a flat

surface extending inwardly from the top of the container and a stacking surface positioned beneath the flat surfaces,

depressions in the corner formed by the rear wall and left wall and in the corner formed by the rear wall and right wall and forming rear wall corner stacking lugs with stacking surfaces,

whereby with an upper container placed upright on top of a lower container with the front walls thereof facing in opposite directions the rear end of said center leg on the upper container contacts the front wall stacking surface of the lower container and the front end of said upper container center leg contacts a rear wall stacking surface of the lower container, said right wall legs of the upper container contact the left wall stacking surfaces of the lower container, and said left wall legs of the upper container contact the right wall stacking surfaces of the lower container, the lower container thereby providing support for the upper container without the need for a lid as a stacking base, and

whereby with an upper container placed over a lower container with the front walls thereof facing in the same direction, the legs on the bottom of the upper container slide past the stacking surfaces and lugs of the lower container and the upper container thus nests within the lower container.

4,416,375

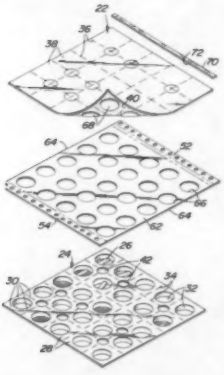
COMPUTER PRINT FORM COVER SHEET FOR MULTI-COMPARTMENT MEDICINAL DISPENSING DEVICE

Milton Braverman, and Leonard Zink, both of Philadelphia, Pa., assignors to Medi-Dose, Inc., Feasterville, Pa.

Filed Apr. 30, 1982, Ser. No. 373,561

Int. Cl.³ B65D *83/04, 85/56, 75/42, 7/28*

U.S. Cl. 206—534.1 **9 Claims**



1. A supply of cover sheets suitable for mechanized handling of computer driven printing means, each of said cover sheets being adapted for securement to a base of a multicompartment medicinal dispensing device to seal said device, said base comprising a plurality of individual medicine holding units releasably secured together along predetermined separator lines, each of said units including a chamber and a flange, each of said cover sheets being divided by weakened lines corresponding to said predetermined separator lines to form individual closure members, one for each unit, said closure members having an inner surface having an adhesive thereon, each of said cover sheets being releasably secured by said adhesive at sequential longitudinal positions along a carrier web, said carrier web having engagement portions in the form of respective marginal edge portions including plural apertures therein arranged to be engaged by computer driven means to carry said cover sheets to a printing station for applying indicia thereon, said carrier web also including plural die cut areas, each of said areas being located under a respective closure member, each of said cover sheets covering said web except the portion including the plural apertured portion of said respective marginal edge portions, said cover sheets being arranged to be removed from said carrier web with said die cut areas of said web remaining secured to said cover sheet to enable said cover sheet to be secured to said base via said flanges whereupon said die cut areas overlie said chambers.

4,416,376

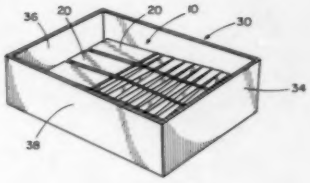
BAG PACKAGE AND RELATED METHOD

Richard W. Scheffers, Mount Prospect, and Hugo Boeckmann, Arlington Heights, both of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Sep. 30, 1982, Ser. No. 431,449

Int. Cl.³ A45C *11/20;* **B65D** *73/00*

U.S. Cl. 206—554 **8 Claims**



1. A method to package a chain of plastic bags in a rectangular carton having a bottom wall and two opposite pairs of vertical walls, wherein each bag is formed of plastic film in a rectangular shape having an upper edge, a lower edge, and opposite lateral edges with zipper-locking profiles running along such bag near an upper edge of such bag, and wherein the bags in the chain are connected one after another at a trailing lateral edge of one and a leading lateral edge of another, the method comprising steps of

(a) laying a whole number of the bags in the chain onto the bottom wall of the carton so as to form a first layer of the bags in the chain, and so as to align the profiles of the bags of the first layer generally along a straight line that is oblique with respect to a selected one of the vertical walls of the carton,

(b) folding the chain where two successive bags in the chain are connected to each other,

(c) laying a whole number of the bags in the chain onto the first layer so as to form a second layer of the bags in the chain, and so as to align the profiles of the bags of the second layer generally along a straight line that is oblique,

(d) laying a whole number of the bags in the chain onto the second layer so as to form a third layer of the bags, and so as to align the profiles of the bags of the third layer generally along a straight line that is parallel to but spaced from the straight line aligning the profiles of the first layer,

wherein the straight lines aligning the successive layers follow a zigzag course.

4,416,377

CONTROLLED ACCESS PACKAGE

Robert H. Swanberg, Montvale, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Mar. 10, 1982, Ser. No. 356,928

Int. Cl.³ B65D *5/54*

U.S. Cl. 206—602 **4 Claims**

1. A carton formed from a one-piece sheet, particularly suited for packaging two different products separated from each other, comprising:

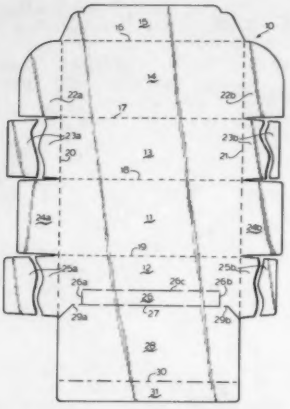
connected front, bottom, back and cover panels and a front cover closure flap;

end closure flaps at the ends of the carton;

a generally rectangular break-away strip cut-perforated in the top of the front panel; and

a shelf panel connected along its back edge to the back panel and connected along its front edge to the top of the break-away strip along a cut-perforated line and by nips at each end to the front panel, the said shelf panel being spaced from the bottom panel to provide separate areas above and below the shelf panel;

the said carton being packaged with one product below the shelf panel and the second product above the shelf panel



with the end closure flaps closing the ends of the carton and the front cover closure flap being secured to the break-away strip of the front panel to completely seal the carton;

the said carton being adapted to be opened by raising the front cover closure flap and tearing loose the break-away strip,

whereby the first product above the shelf panel will be accessible until exhausted after which the shelf panel can be torn from the nips at each end to provide access to the second product.

4,416,378

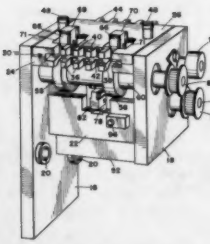
STATIC DIVERTER MODULE

Gregory E. Miller, 1661 Felicita La., Escondido, Calif. 92025

Filed Dec. 1, 1980, Ser. No. 211,024

Int. Cl.³ B07C 5/00; B65H 5/00

U.S. Cl. 209—583 **12 Claims**



1. A diverter unit for a ticket handling system, said unit comprising:

housing means having a pair of spaced apart plates defining a primary transport passage therebetween having an inlet and an outlet,

primary drive means for transporting a ticket through said passage between the inlet and the outlet, and

diverter means including a pair of spaced apart curved plates defining a capture passage therebetween intersecting said primary transport passage, and a diverter plate extending from said capture passage into said transport passage for intercepting and diverting a ticket passing in a predetermined direction in said primary transport passage from said primary transport passage into said capture passage.

4,416,379

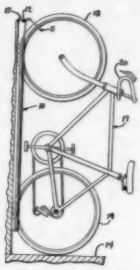
BICYCLE STORAGE DEVICE

Joseph V. Graber, 3739 County Trunk M, Middleton, Wis. 53562

Filed Jul. 10, 1981, Ser. No. 281,963

Int. Cl.³ A47F 7/00

U.S. Cl. 211—19 **13 Claims**



1. A bicycle storage device comprising, an elongated wheel receiving channel having a base wall and laterally spaced relatively diverging side walls adapted to receive a wheel of a bicycle with the bicycle wheel disposed in a longitudinal medial plane bisecting the channel, a rigid wheel engaging hook, and bracket means attached to both side walls of the channel rigidly mounting one end of the hook solely on said side walls of the channel with the hook extending from said one end thereof crosswise of said longitudinal medial plane and terminating with its free end at the other side of said longitudinal medial plane, the hook being offset from the open side of the channel a distance such that the free end of the hook is spaced from a plane through the open side of the channel a distance greater than the radial depth of the rim and tire portion of a bicycle wheel to allow the bicycle wheel to be moved laterally of said longitudinal medial plane past the free end of the hook and then shifted in said longitudinal medial plane until it rests in the channel and engages the hook for support thereby.

4,416,380

PRODUCT MERCHANDISING RACK

Paul Flum, University City, Mo., assignor to Paul Flum Ideas, Inc., St. Louis, Mo.

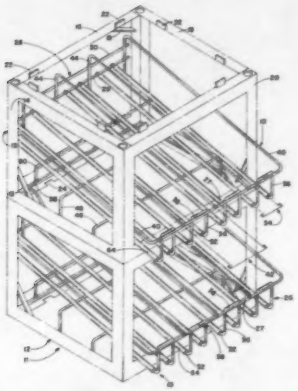
Filed May 11, 1981, Ser. No. 262,117

Int. Cl.³ A47F 7/28

U.S. Cl. 211—49 D **17 Claims**

1. A rack device adaptable for use on a support structure for storing and merchandising shelved products comprising an open grid rack structure formed by a plurality of connected spaced rod members including a front wall portion extending substantially across the entire front portion of said device, a rear wall portion and spaced rod members connected therebetween, said spaced rod members including a first set of spaced rod members arranged in groups to form a plurality of parallel adjacent tracks extending between the front and rear wall portions for supporting rows of products thereon, each of said

rod members forming said first set of spaced rod members having an angularly disposed upwardly extending portion associated therewith forming a portion of said front wall, a second set of spaced rod members disposed in a common plane above the first set of spaced rod members to form a plurality of channels extending between the front and rear wall portions for guiding products positioned on the tracks in parallel rows therebetween, each of said channels being positioned such that a respective track forms the bottom thereof, each of said rod members forming said second set of spaced rod members having an angularly disposed downwardly extending portion associated therewith forming at least a portion of said rear



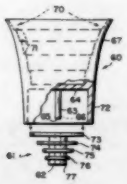
wall, a transverse rod member spaced above said first set of spaced rod members and extending substantially across the front portion of said device, said transverse rod member being connected to the rod members of said second set of spaced rod members and to the upwardly extending portion of each of the rod members of said first set of spaced rod members together forming said front wall, and other rod members attached to said first set of spaced rod members for supporting the rear wall portion at a higher elevation than the front wall portion when said device is supported on a horizontal surface whereby rows of products positioned in each of the channels will slide along the respective channels on the respective tracks positioned therebelow towards the front wall portion.

4,416,381

BOTTLE CAP WITH INTEGRAL MEASURING CUP AND BOTTLE CLOSURE

Everett W. Swartwout, 5816A S. Wolf Rd., Western Springs, Ill. 60558

Filed Nov. 27, 1981, Ser. No. 325,295
Int. Cl.³ B65D *41/26*
U.S. Cl. 215—228 **10 Claims**



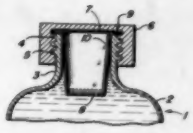
1. A bottle cap including an integral measuring cup comprising a base having a periphery, a sidewall extending upwardly from said periphery forming a cup having at least one graduation on the interior wall of said cup indicating a volume level, and a closure member extending from the base and adapted to seal the opening of a bottle, said closure member including a plurality of spaced apart disk-shaped wing members extending parallel with said base, said wing members being adapted to deform when said closure member is inserted into a bottle to hold the cap on the bottle and prevent spillage therefrom.

4,416,382

MERCURY CONTAINER

James B. Lawrence, and Bruce J. Lawrence, both of Coopersburg, Pa., assignors to Bethlehem Apparatus Company, Inc., Hellertown, Pa.

Filed Mar. 22, 1982, Ser. No. 360,378
Int. Cl.³ B65D *55/00*
U.S. Cl. 215—231 **5 Claims**



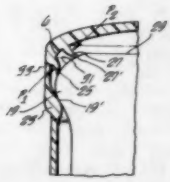
1. A container for the transport and storage of metallic memory comprising a bottle having a neck which terminates in a rim, a truncated conical thimble disposed within said neck, said thimble having a flange adapted to rest on said rim, at least one opening having closure means, said opening formed in the upper side wall of said thimble adapted to allow a one way entry into the thimble of a small amount of expanding mercury which is retained in the thimble and separated from the rest of the mercury in the bottle, and a closure member adapted to engage the outer surface of said neck and the upper surface of said flange thereby sealing said bottle and said thimble against the loss of any mercury contained therein.

4,416,383

CLOSURE AND SEALING DEVICE

Carl E. Frahm, 1428 Oak Meadow Rd., Arcadia, Calif. 91006; Erick L. Larson, 4916 Del Monte Rd., La Canada, Calif. 91001, and John M. S. McAulay, 2412 W. 227th St., Torrance, Calif. 90501

Filed Oct. 29, 1981, Ser. No. 316,239
Int. Cl.³ B65D *41/48*
U.S. Cl. 215—256 **11 Claims**



1. A closure device for closing and sealing a vessel orifice defined by a vessel lip protruding radially and axially from the orifice comprising:

a generally cup-shaped body having a radially extending cover portion adapted to cover the orifice and a depending skirt portion extending axially from the cover portion adapted to surround and close the orifice defined by the lip;

a first elongated sealing member adjacent the junction of the cover portion and the skirt portion of the closure device

extending inwardly from the cup-shaped body portion constructed and arranged to be urged into sealing engagement with the lip upon being placed over the orifice defining lip, the first sealing member being constructed and arranged to seal against a generally radially extending surface of the lip; and

a second elongated sealing member adjacent the junction of the cover portion and skirt portion of the closure device extending inwardly from the cup-shaped body portion constructed and arranged to be urged into sealing engagement with the lip upon being placed over the orifice defining lip, the second sealing member being constructed and arranged to seal against a generally axially extending surface of the lip, the first sealing member and the second sealing member being angularly disposed to each other so that the first sealing member is urged into further sealing engagement with the lip when the pressure inside the vessel is greater than the ambient pressure and the second sealing member is urged into further sealing engagement with the lip when ambient pressure is greater than the pressure inside the vessel.

4,416,384

TANK CONTAINER WITH MOUNTING MEANS

Anders Bjurling, Skultuna, Sweden, assignor to Dynatrans AB, Hisings Backa, Sweden

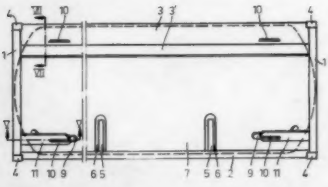
PCT No. PCT/SE81/00073, § 371 Date Nov. 6, 1981, § 102(e) Date Nov. 6, 1981, PCT Pub. No. WO81/02561, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 9, 1981, Ser. No. 320,955

Claims priority, application Sweden, Mar. 7, 1980, 8001797

Int. Cl.³ B65D *88/06*

U.S. Cl. 220—1.5 **3 Claims**



1. A metal tank container comprising a framework surrounding a substantially cylindrical tank with curved surface ends disposed therein, characterized in that a plurality of longitudinally disposed axial suspension plate members are affixed to the tank with one set mounted on the cylindrical tank surface with a mount pliable in the radial direction to bear thereupon for transmitting forces substantially only in their longitudinal direction and another set mounted on the tank ends with a mount pliable in the longitudinal direction to bear thereupon for transmitting forces substantially only in their radial direction and which suspension plate member sets are disposed between the framework and the tank at opposite ends thereof with the respective axial and radial members bearing on the tank walls substantially only in the respective axial and radial directions of the tank wall, and thereby mounted so that the forces between the tank and the framework are transmitted substantially without bending moments on the curved surfaces of the tank wall.

4,416,385

FREIGHT CONTAINERS

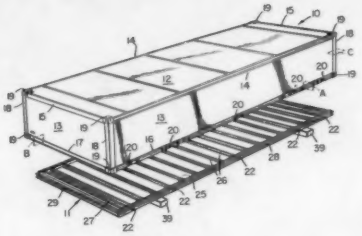
Kenneth D. Clare, Cheadle, and Michael F. J. Ambrose, Macclesfield, both of England, assignors to Fairey Engineering Limited, Hounslow, England

Filed Dec. 22, 1981, Ser. No. 333,626

Claims priority, application United Kingdom, Dec. 23, 1980, 8041268

Int. Cl.³ B65D *19/04, 88/00, 81/02*

U.S. Cl. 220—1.5 **8 Claims**



1. A stackable rectangular freight container which comprises a rigid bottomless rectangular container body having a doorless top wall and four doorless side walls, the top wall and side walls being permanently joined together at their adjacent edges along the respective edges of the container body, and the only access to the interior of the container body being through the open lower side, in combination with a rigid load supporting pallet of rectangular profile over which the container body can be lowered to enclose a load supported on the pallet, the pallet then forming the floor of and totally closing the container, and means being provided for releasably securing the peripheral edge of the pallet to the lower edges of at least two opposite side walls of the container body to secure the container in its closed condition such that in the closed condition the lower edges of the container body lie outside and around the peripheral edge of the pallet, said container body including support means configured so that when said container is used the closed container is placed on a flat supporting surface and said support means of the container body rests on the supporting surface with the pallet suspended clear of the supporting surface by the container body through the releasable securing means.

4,416,386

CONTAINER FOR PRESSURIZED PRODUCTS

John Walter, Evergreen Park, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Division of Ser. No. 217,616, Dec. 18, 1980, Pat. No. 4,345,047. This application Mar. 15, 1982, Ser. No. 358,066

Int. Cl.³ B65D *8/22;* **C08L** *63/00*

U.S. Cl. 220—67 **14 Claims**

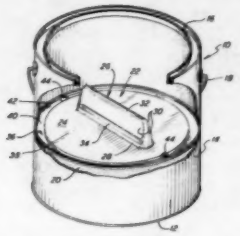
1. A container for pressurized products comprising a top portion and a bottom portion having overlapped cylindrical wall sections in telescoped relation and an adhesive composition interposed therebetween bonding the opposed surface portions of the overlapped sections to each other, the adhesive being comprised of an admixture of about 10 to about 70% by weight of a thermoplastic vinyl chloride polymer resin about 20 to about 85% by weight of a thermoplastic acrylonitrile/-butadiene/styrene copolymer containing about 10 to about 30% by weight acrylonitrile, about 10 to about 30% by weight butadiene and about 40 to about 70% by weight styrene and about 5 to about 30% by weight of a thermosetting epoxy resin.

4,416,387

PAINT PRESERVER

Joseph V. D'Antonio, Media, Pa., assignor to Richard L. Bates, Camillus, N.Y., a part interest

Filed Jun. 11, 1982, Ser. No. 387,448
Int. Cl.³ B65D *25/10*
U.S. Cl. 220—93 **7 Claims**



1. A device for protecting a substance in a container having a cylindrical wall with an inner diameter and a closed bottom, against the environment, said device having an upper side and a lower side and comprising:

a generally flat, resilient central portion;

a compressible, elongated, resilient hollow handle extending upwardly from and in a crosswise directions to said central portion, said handle having opposite end sections and side sections;

channel means extending peripherally about said central portion, said channel means including a base portion, an inner wall portion extending upwardly from said base portion and a generally circular outer wall portion extending upwardly from said base portion, said central portion extending across the upper part of said inner portion to form a cavity when said device is sitting on the substance in the container for rendering said device buoyant;

crease means extending radially across said channel means; and

an annular peripheral portion extending radially outwardly from the outer wall portion of said channel means for engaging the wall of a container in which said device is inserted;

said device having a generally flattened open condition and folding along said crease means upon the compression of the side sections of said handle into a closed position for reducing the projected area of said device for enabling the insertion and removal of said device into and out of a container, said device assuming the open position upon release of said handle in a container for covering the substance and sealing the substance from the environment.

4,416,388

PRESSURE RELIEF DEVICE

Walter J. Mulawski, Chelmsford, Mass., assignor to Sexton Can Company, Inc., Everett, Mass.

Filed Sep. 20, 1982, Ser. No. 419,665
Int. Cl.³ F17B *1/14*; B21D *51/26*
U.S. Cl. 220—207 **11 Claims**

1. A pressure relief device for a container having a cylindrical side wall which is closed at one end by an internally concave bottom wall, said device comprising:

an externally protruding first cup formed as an impression in said bottom wall, said first cup having a first circular wall joined at one end to said bottom wall and closed at the opposite end by a first base portion;

a tab member in said first base portion, said tab member being partially circumscribed by a line of reduced material thickness, said first base portion being adapted to separate along said line in response to an overpressurization of the contents of said container, thus freeing said tab member for outward deflection to provide an outlet through which said contents may escape; and

a second element having a second circular wall forcibly received within the first circular wall of said first cup, said second circular wall being dimensioned to coact with said first circular wall to radially stress said first base portion in tension.

8. For use with a container having an internally concave closure wall, a pressure relief device comprising:

an externally protruding impression in said closure wall, said impression having a single weakened line of reduced material thickness partially circumscribing a tab member, said line being adapted to rupture in response to overpressurization of the contents of said container, thus permitting said tab member to deflect outwardly and to create an opening through which said overpressurized contents may be vented to the atmosphere, and

metering means forcibly seated in said impression for radially outwardly stressing said impression and for reducing the rate at which said contents are vented through said opening.

4,416,389

RETAINED TAB EASY OPEN END (SMALL POUR HOLE)

Harlen E. Wilkinson, Crystal Lake, and Fred W. Wren, Addison, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Oct. 26, 1982, Ser. No. 436,858
Int. Cl.³ B65D *41/32*
U.S. Cl. 220—269 **8 Claims**

1. An easy open closure for a hollow cylindrical container body having at least one open end said closure comprising:

(a) a circular recessed central panel situated in a plane bounded by an outwardly stepped annular wall generally normal to said plane,

(b) a peripheral flange atop said wall extending radially outward for joining said closure to one open end of said container body;

(c) a raised portion of said recessed panel offset to one side thereof and extending from said wall to about the middle of said recessed panel and said raised portion is in a plane slightly above the plane of said recessed central panel;

(d) an integral rivet formed within said raised portion;

(e) a displaceable panel in said raised portion disposed about said rivet and substantially defined by scoring;

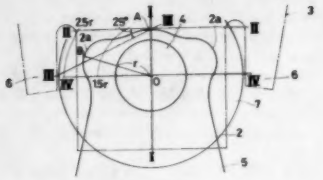
(f) a ring pull tab having a tab nose and a tab lift with a central web therebetween and wherein said tab web is apertured to be joined to said displaceable panel by means of said rivet and said ring pull tab staked by said integral rivet with said tab nose near said wall and said tab lift near said middle, and

(g) an unstepped portion of said wall in the area adjacent said tab nose.

4,416,390
CLOSURE ARRANGEMENT FOR EASY OPEN TYPE CONTAINER

Minoru Takeda; Toshimi Nitta, and Hitoshi Saito, all of Iwatsuki, Japan, assignors to Hokkai Can Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1982, Ser. No. 402,334
Claims priority, application Japan, Jul. 29, 1981, 56-117671
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—273 7 Claims



1. A closure arrangement for an easy open type container comprising:

a closure panel surface;

a rivet formed to project integrally from the panel surface;

a score line defining a tear opening portion including the rivet therein;

a pulling tab secured, by staking, to the rivet and extending in a direction opposite to the tear opening portion;

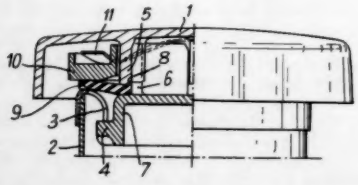
said pull tab including a front end portion serving as a fulcrum for the pulling tab on lifting a rear end portion of the pulling tab;

said score line including a point lying on a longitudinal axis of the pulling tab passing through the center of the rivet, said point being a minimum distant point from the center of the rivet, and said score line extending from the minimum distant point to the right side and the left side to project outwardly between a first subsidiary line crossing at right angles to the longitudinal axis at the minimum distant point and a third subsidiary line passing through the center of the rivet and extending in parallel with the first subsidiary line to form a pair of swelling score line sections on both sides of the rivet.

4,416,391
SEALS-CAPS FOR FUEL TANKS

Jean-Michel Sarrazin, Sainte Luce sur Loire, France, assignor to Compagnie des Produits Industriels de l'Ouest, Nantes, France

Filed Aug. 13, 1982, Ser. No. 408,046
Claims priority, application France, Aug. 13, 1981, 81 15667
Int. Cl.³ B65D *53/00*
U.S. Cl. 220—304 5 Claims

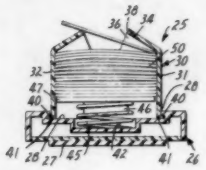


1. A seal-cap, particularly for fuel tanks, comprising a body having a cylindrical prolongation directed toward a spout of the fuel tank, an element formed thereon having radially extending wings which travel along a helicoidal gradient located inside said fuel spout, a seal gasket being welded between a shoulder of said element and the lower edge of said cylindrical prolongation, a U-shaped ring being urged against said gasket by spring means which rest upon the inner side of said cap.

4,416,392
DISPENSER FOR ADHESIVE COATED SHEET MATERIAL

Daniel D. Smith, Cottage Grove, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Feb. 19, 1981, Ser. No. 235,842
Int. Cl.³ B65H *1/00*
U.S. Cl. 221—45 7 Claims

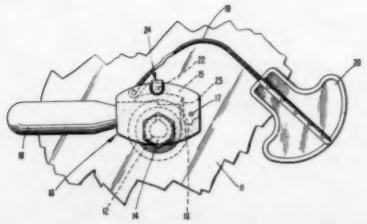


1. A dispenser comprising flexible sheet material stacked with each sheet adhered adhesively by a narrow band of readily releasable repositionable adhesive coated on the lower side along one edge thereof to the next adjacent sheet along alternately opposite edges of successive sheets, said stacked material being placed in a container comprising side walls joined by a top wall which top wall is divided to define two symmetrical portions by a dispensing opening extending transversely of the top wall in a direction parallel to said sidewalls, said opening being spaced from said sidewalls with said portions of the top wall covering the edges of said stack of adhesive coated sheets whereby, pulling an edge of one sheet, which edge is free of adhesive, will draw that sheet through the opening of the dispenser and the adhesive on the opposite edge of the sheet withdrawn will withdraw the adjacent adhesive free edge of the next successive sheet in the stack to pull said adjacent edge through the opening, then the dispensed sheet can be peeled from said next sheet in the stack leaving the free edge of the next sheet projecting through said dispensing opening.

4,416,393
INFLATOR GUARD

Harry L. Zimmerly, Largo, Fla., assignor to Halkey-Roberts Corporation, Paramus, N.J.

Filed Sep. 23, 1981, Ser. No. 305,038
Int. Cl.³ B63C *9/24*; B67B *7/24*
U.S. Cl. 222—5 8 Claims



1. In combination, a manually operated inflator and a guard therefor to prevent the inadvertent operation of the inflator, the inflator having a body, means for mounting on the body a compressed gas containing capsule having a frangible seal, a piercing pin movable toward the seal to pierce it, means thus to

move the piercing pin, and a lever pivoted on the body to actuate the piercing pin when a part of the lever is swung outwardly from the body of the inflator, the guard being a generally U-shaped member having a broad main part and parallel legs extending therefrom, the guard being separate from both the body of the inflator and the lever, the broad main part of the guard overlying the retracted part of the lever which is swung out when the inflator is operated, and the legs of the guard forcible engaging opposite sides of the body of the inflator and thus holding the guard in place on the inflator.

4,416,394

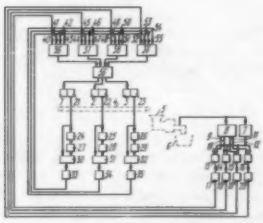
REGULATING APPARATUS FOR AUTOMATICALLY CONTROLLING THE PRODUCTION OF A COMMINUTED MIXTURE HAVING PRESCRIBED COMPOSITION

Yakov E. Gelfand; Marina L. Komova, both of Leningrad; Eduard G. Shtengel, Pushkin, and Leonid M. Yakovis, Leningrad, all of U.S.S.R., assignors to Vsesojuzny Nauchno-issledovatelsky i proektno-konstruktorsky institut po avtomatizatsii predpriyaty promyshlennosti stroitelnykh materialov, Leningrad, U.S.S.R.

Filed Aug. 20, 1981, Ser. No. 294,793

Int. Cl.³ B67D *5/08*

U.S. Cl. 222—55 **1 Claim**



1. A regulating apparatus for automatically controlling the production of a comminuted mixture out of big-sized starting materials by means of a comminution device, said comminuted mixture having a prescribed concentration of controlled components, said apparatus comprising:

metering devices for dispensing said starting materials, each of said metering devices having a control input;

a plurality of starting material flow meters equal in number to the number of said starting materials, said starting material flow meters being respectively responsive to the rates of flow of the starting materials metered by said metering devices;

a comminuted mixture flow meter responsive to the rate of flow of the mixture leaving said comminution device;

a composition determining means having a plurality of outputs equal in number to the number of said controlled components for developing at said outputs signals respectively proportional to the concentrations of said controlled components in the mixture leaving said comminution device;

a plurality of multiplying devices equal in number to the number of said controlled components and each having a first input, a second input and an output, said first inputs of said multiplying devices being connected to said comminuted mixture flow meter and said second inputs of said multiplying devices being respectively connected to said outputs of said composition determining means;

a first plurality of integrators equal in number to the number of said controlled components and each having an input and an output, said inputs of the integrators of said first plurality of integrators being respectively connected to said outputs of said multiplying devices;

a plurality of circuits equal in number to the number of said starting materials and each including a delay unit and an aperiodic unit and having an input and an output, said inputs of said circuits being respectively connected to said starting material flow meters;

a plurality of subtraction devices equal in number to the number of said starting materials and each having a first input, a second input and an output, said first inputs of said subtraction devices being respectively connected to said starting material flow meters and said second inputs of said subtraction devices being respectively connected to said outputs of said circuits;

a second plurality of integrators equal in number to the number of said starting materials and each having an input and an output, said inputs of the integrators of said second plurality of integrators being respectively connected to said outputs of said subtraction circuits;

a plurality of adders equal in number to the number of said controlled components and each having a plurality of inputs equal in number to the number of said starting materials, an additional input, and an output, the inputs of said plurality of inputs of each of said adders being respectively connected to said outputs of the integrators of said second plurality of integrators and said additional inputs of said adders being respectively connected to said outputs of the integrators of said first plurality of integrators; and

a control means for adjusting said metering devices and having a plurality of inputs equal in number to the number of said controlled components and a plurality of outputs equal in number to the number of said starting materials, said inputs of said control means being respectively connected to said outputs of said adders and said outputs of said control means being respectively connected to said control inputs of said metering devices.

4,416,395

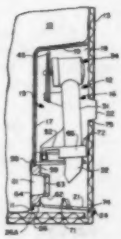
BULK LIQUID CONTAINER, TAP AND TAP ASSEMBLY THEREFORE

Rene J. M. Gaubert, 4219 Oakmore Rd., Oakland, Calif. 94602

Continuation-in-part of Ser. No. 146,762, May 5, 1980, Pat. No. 4,314,654, which is a continuation-in-part of Ser. No. 116,475, Jan. 9, 1980, abandoned. This application Sep. 28, 1981, Ser. No. 305,922

Int. Cl.³ B67B *7/26*

U.S. Cl. 222—83 **8 Claims**



1. A tap assembly for dispensing liquid from a pouch having a dispensing fitting attached to one wall of the same, the fitting having a passage therethrough and an exterior annular portion extending from the wall of the pouch and terminating in an outer end, the fitting also having a sealing membrane serving to seal the passage, the tap assembly comprising a tubular body having an end portion adapted to be projected into the passage of the fitting to disrupt the membrane, a dispensing valve at the other end of the body, means forming a seal between the peripheral surface of said end portion of the body and the outer end of the fitting, and means for forming another seal between the outer end of said annular portion and the body, said last named means including an annular member surrounding and carried by said tubular body, said member being formed of

pliable material shaped to form a socket recess dimensioned to embrace the said outer end of the annular portion of the fitting and to establish a seal between the outer end of the fitting and the tubular body when said end portion is thrust into the fitting to establish the first named seal and then to rupture the diaphragm, and is thereafter further advanced into the fitting to position the outer end of the fitting within the recess and in sealing engagement with said annular member.

7. A tap construction for dispensing liquid from a liquid containing pouch, the pouch having a dispensing fitting secured to one wall of the same and having an opening through which liquid may flow, comprising an elongated tubular body having a flow passage through the same, a hollow valve body having one side of the same secured to one end of the tubular body and in communication with the passage, one end of the valve body, namely that end which is lower-most when the tap is in dispensing position, having a wall forming an annular valve seat, an annular valve member within the valve body and adapted to engage said seat, an operating stem extending through the valve body and having its lower end fixed to the valve member, means forming a closure for the upper end of the valve body, said closure means having an opening for accommodating the valve stem and formed to maintain a seal between the valve body and the valve stem, and operating means in the form of a strip for moving the stem and valve member from a lower closed position in which the valve member is in sealing engagement with the seat, to a position in which the valve member is raised from the seat to permit dispensing of liquid, the strip having two spaced slots, one slot being at an end of the strip, and the second slot located intermediate the ends of the strip and having a keyhole configuration, a member mounted on the tap body having a notch and dimensioned to be engaged by the slotted end of the strip to from a fulcrum attachment, the upper exterior end of the valve stem being dimensioned and formed to be engaged and retained within the second slot to form a fulcrum attachment.

8. A tap assembly for mounting on one wall of a carton which has an inner flexible liner capable of containing liquid to be disposed, the assembly comprising an elongated housing having an open front, a back wall and spaced side walls, the front edges of the side and bottom walls having means for attaching the same to said one wall of said carton, the side walls being so formed and of such material that they can be sprung apart, a tap dimensioned to be accommodated in the housing, the tap comprising an elongated tubular body and an arm fixed to the body, the arm having two aligned pivot pins on an axis at right angles to the axis of the body, pivot openings in the side walls near the back wall, and on an axis extending laterally of the length of the housing and parallel to the back wall, parallel guide tracks formed on the inner faces of the side walls extending from the front edges of the side walls to said pivot openings, said tracks being formed to guide the pivot pins into said pivot openings when the pins are engaged in said tracks at the open front of the housing and then manually traversed to the inner ends of the tracks with outward springing of the side walls.

4,416,396

PORTABLE FUEL AND OIL DISPENSING CONTAINER

Jackson G. Ward, P.O. Box 241, Prairie Grove, Ark. 72753

Filed Feb. 10, 1981, Ser. No. 233,049

Int. Cl.³ B67D *5/08*

U.S. Cl. 222—129 **13 Claims**

1. A dual container and dispenser for two different liquids comprising

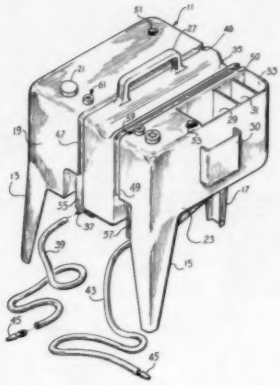
a unitary dispenser body having first and second adjoining isolated compartments suitable for liquid containment,

a conduit in communication with the interior of said first compartment near the bottom thereof,

a hose connected to said conduit,

a valve member including a normally closed liquid valve connected internally to said conduit to control liquid flow therethrough and a passage from the top exterior of said liquid compartment to the portion of said conduit exterior to said valve,

means including an external actuating member for opening said liquid valve upon manual operation of said actuating member, and



leg members for supporting said dispenser with the bottom of said compartments spaced above the surface on which said dispenser is placed.

4,416,397

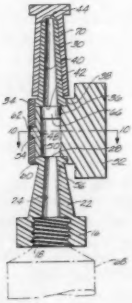
TAMPERPROOF METERING DISPENSER

Frank E. Brown, 1741 Camino De Villas, Burbank, Calif. 91501

Continuation of Ser. No. 148,780, May 12, 1980, abandoned, which is a continuation of Ser. No. 941,030, Sep. 11, 1978, abandoned. This application Jan. 12, 1981, Ser. No. 224,620

Int. Cl.³ G01F *11/04*

U.S. Cl. 222—219 **11 Claims**



10. A dispenser comprising:

a body having an inlet passage for receiving and containing material to be dispensed, an outlet passage for containing and dispensing a metered amount of the material, and a valve seat between the inlet and outlet passages, the valve seat having a first opening from the inlet passage and a second opening to the outlet passage;

a rotatable valve member disposed in the valve seat, the valve member having a first passage extending through it and a second passage extending through it and intersecting the first passage; and

a first piston in the first passage, and a second piston in the second passage, each piston being movable in its corresponding passage from relatively nearer the first opening

to relatively nearer the second opening when such passage is aligned with the inlet and outlet passages, each piston being sufficiently short in length to unblock passage across the intersection of the two passages, the length of each piston being greater than the width of the passage containing the other piston.

4,416,398

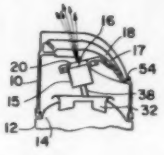
VARIABLE SPRAY OVERCAP AEROSOL ASSEMBLY

Michael G. Knickerbocker, McHenry, Ill., assignor to Seaquist Valve Co., Div. of Pittway Corp., Cary, Ill.

Continuation-in-part of Ser. No. 171,357, Jul. 23, 1980, Pat. No. 4,328,911. This application Feb. 11, 1982, Ser. No. 347,687

Int. Cl.³ B65D *83/14, 55/12*

U.S. Cl. 222—402.13 **18 Claims**



18. A plural rate aerosol assembly for use with an aerosol container having a valve for discharging an aerosol product at a first rate upon movement of the valve in a first direction and a second rate upon movement of the valve in a second direction, comprising in combination:

an actuator button having a terminal orifice;

a valve stem connecting said actuator button with the valve for enabling discharge of the aerosol product from said terminal orifice upon movement of the valve;

an overcap rotatably secured to the aerosol container for at least partially covering said actuator button;

a finger actuator movably mounted relative to said overcap; and

means established between said finger actuator and said actuator button for enabling said finger actuator to move the valve in the first direction upon a first rotational position of said overcap and for enabling said finger actuator to move the valve in the second direction upon a second rotational position of said overcap.

4,416,399

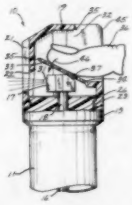
AEROSOL CANISTER

Erwin W. Parr, and Timothy B. Brandt, both of Des Moines, Iowa, assignors to Ziphron, Inc., Des Moines, Iowa

Filed Jun. 12, 1981, Ser. No. 272,908

Int. Cl.³ B65D *83/14*

U.S. Cl. 222—402.13 **1 Claim**



1. An actuator mechanism for an aerosol container of a type including a chamber for holding fluid under pressure, an outlet opening disposed in said container, and valve means attached to said container for controlling the flow of fluid from said outlet opening, said actuator mechanism comprising:

a cap having an outlet opening on one side thereof;

means for attaching said cap to said container adjacent to said outlet opening;

actuation means for selectively causing fluid to be dispensed from said chamber and out through the outlet opening of said cap upon reciprocation of said actuation means with respect to said container, said actuation means including nozzle means for permitting fluid to be sprayed therethrough, said nozzle means being aligned with the outlet opening in said cap, and stem means operatively attached to said nozzle means and to said valve means for communicating fluid from the container chamber, through said valve means and to said nozzle means when said valve means is open;

access means disposed in said cap for permitting manual reciprocation of said actuation means;

means for slideably connecting said cap to said actuation means for preventing said stem means from bending during actuation of said actuation means, said connecting means comprises means for forming a groove disposed in one of said actuation means and cap and a complementary projection means on the other of said actuation means and said cap for being disposed in said groove, said groove means and projection means being of such a relative size and shape to permit relative sliding movement thereof, a second groove means in one of the actuation means and cap and being disposed on the opposite side from the first said groove means, and a second projection means on the other of said actuation means and cap and being disposed in said second groove means for relative sliding movement of one with respect to the other of said second groove means and second projection means, and the first said groove means and the second groove means are disposed on opposite sides of said actuation means and the first said projection means and the second projection means are disposed on opposite interior sides of said cap, said access means being disposed to one side of said groove means and projection means, said access means further being disposed on the opposite side of said cap from said cap outlet opening and said connecting means being disposed generally between said cap outlet opening and said access means, said access means includes means on said cap for forming an access opening, flap means disposed in said opening, and being attached to said cap on at least two sides thereof for preventing accidental actuation of said actuation means and for permitting at least one of said attachments to said cap to be selectively forceably broken for permitting said flap to be pushed against said actuation means for spraying said fluid under pressure from said container, said flap means attachments include a relatively stronger hinge attachment at the bottom thereof and a relatively weaker frangible attachment at the top thereof, whereby the top of said flap means will pivot inwardly of said cap and downwardly onto said actuation means when said flap means is pushed for spraying of said fluid, and wherein said cap is closed at the top thereof to prevent accidental actuation of said actuation means; and

means for automatically aligning the nozzle with the cap outlet opening, said aligning means comprising the first said complementary groove means being too small to receive the second projection means whereby the cap cannot be placed over the actuation means in a reverse fashion.

4,416,400

ONE PIECE DISPENSER

Frank E. Dougherty, Sr., Mays Landing, N.J., assignor to Dougherty Brothers Company, Buena, N.J.

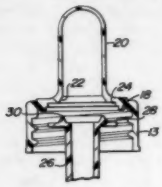
Filed Oct. 24, 1978, Ser. No. 954,253

Int. Cl.³ B65D *47/18*

U.S. Cl. 222—420 **7 Claims**

1. A one piece dispenser comprising a circular cap having threads on a surface thereof to facilitate coupling of the cap to

a container, a flexible bulb integral in one piece at the open end thereof with a top wall of said cap, said bulb having a wall thickness of substantially less than the wall thickness of said top wall of said cap so as to be more flexible, a pipette coaxial with said cap and bulb, one end of said pipette having a flange welded to said top wall of said cap at a location radially inwardly of the periphery of said flange and adjacent the intersection of said top wall and said open end of said bulb, the inner



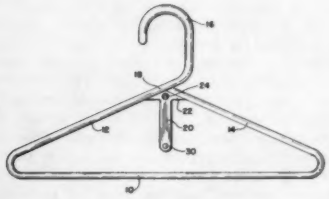
surface of said top wall of said cap having an annular recess within which is disposed said pipette flange, said top wall of said cap extending radially outwardly from the periphery of said flange, said inner surface of said top wall having a bead radially outwardly from said recess, said bead being adapted to contact the rim of a container when the cap is coupled to a container, said one end of said pipette being in open communication with said bulb, said cap, bulb and pipette being made from a polymeric plastic material.

4,416,401

CLOTHES HANGER

Richard J. King, c/o Reel King, Inc., 149 Hamilton St., Leominster, Mass. 01453

Filed Mar. 22, 1982, Ser. No. 360,399
Int. Cl.[3] A47J *51/082, 51/097*
U.S. Cl. 223—88 **2 Claims**



1. A one-piece molded clothes hanger of plastic material comprising a hook, a closed loop including a bottom generally straight bar and connected bars sloping upwardly from the ends of the straight bar to the hook, said bars having a degree of resilient flexibility so that the bottom straight bar may be flexed so that its center portion approaches the junction of the sloping bars and returns to original shape upon release of the force flexing the straight bar,

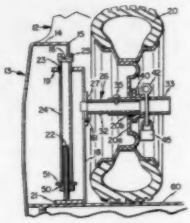
a thin flexible strap molded integral with the hanger and having an end at the junction of the sloping bars and depending therefrom, a hole at one end of the strap, a stud at the other end thereof, the stud having an enlarged head with a diameter greater than that of the hole so that the hole end of the strap is detachably connectible to the stud end making a loop, whereby said loop formed from said flexible strap is capable of receiving said straight bottom bar in flexed condition and holding said bottom bar flexed, or is capable of receiving the hook of another hanger.

4,416,402

SPARE TIRE MOUNT FOR PICKUP TRUCK

Lee M. Matthew, Frederick, Okla., assignor to James Elton Matthew, Burkburnett, Tex.

Filed Jan. 19, 1983, Ser. No. 459,277
Int. Cl.[3] B60R *9/02*
U.S. Cl. 224—42.24 **10 Claims**



1. A spare tire mount for a pickup truck comprising:

a main support structure comprising:

a support member having an upper and lower plate affixed at either end thereof, said upper plate having an opening therethrough;

a threaded member affixed to the upper side of said lower plate and extending upward therefrom;

a follower assembly threadly positioned on said threaded member;

an elongated latching element slidably positioned through said opening in said upper plate, said latching element having a lower end in contact with said follower assembly on said threaded member and an upper end adapted to engage the underside of upper sidewall portion of the load bed of a pickup truck when said spare tire mount is in an operable position; and

tire securing means comprising:

a carriage slidably mounted on said main support means; and

tire mounting means affixed to said carriage adapted to receive a spare tire.

4,416,403

CHILD CARRYING BACK PACK

Allan H. Johnson, Im Haeldele 52, 7634 Kippenheim, Fed. Rep. of Germany

Filed May 18, 1981, Ser. No. 264,848
Claims priority, application Canada, Jun. 3, 1980, 353272
Int. Cl.[3] A45F *3/00*
U.S. Cl. 224—161 **5 Claims**

1. A carrier adapted to be worn by an adult to secure in place a child seated upon the adult's shoulders, comprising: upper support means including: frame means having a pair of interconnected side frame members adapted to be laterally spaced in an upright orientation behind and projecting upwardly of the shoulders of the adult; flexible back restraint means at-

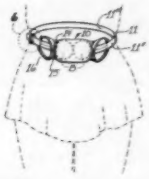
tached to said side frame members to define a retaining web which in use is spaced behind the head of the adult and supports the back and seat of the child; and front restraint means attached to each of said side frame members and adapted to secure the child against movement out of said carrier in the forwards direction; lower support means comprising a belt adapted to be strapped to the body and supported on the hips of the adult; a thrust support interconnecting the frame means to said belt said thrust support being formed by downwardly extended lower ends of said side frame members; said retaining web having a bottom portion from which extend a pair of laterally spaced length-adjustable shoulder straps adapted to extend over the front of the adult's shoulders and be attached to said lower support means; and a pair of transverse frame members interconnecting said side frame members at spaced locations in their length, the opposite ends of said transverse frame members being pivotally interconnected to the respective side frame members to form a parallelogram linkage which is movable between an extended condition wherein the side frame members are spaced apart and a collapsed condition wherein the side frame members lie adjacent each other.

4,416,404

BELT TYPE GARMENT FOR CARRYING TENNIS BALLS AND THE LIKE

Fitz A. S. C. Daniels, 6060 Duke St., Alexandria, Va. 22304

Filed Jan. 26, 1983, Ser. No. 461,227
Int. Cl.³ B65D *85/00*
U.S. Cl. 224—224 **8 Claims**



1. A belt type garment for carrying tennis balls and the like comprising;

an elongate, longitudinally extending belt portion having front and rear surfaces and on one extremity thereof means thereon for removably fastening said belt portion around the waist of the wearer with said rear surface facing the wearer and said front surface facing away from the wearer; and

a tubular section for carrying at least one of the balls having its longitudinal joinder secured by means to the rear surface of the belt portion such that the belt portion passes through the tubular section longitudinally at the inner circumference having an opposite extremities of the tubular section, symmetrical orifices having throats constricted transversely to the tubular axis by elongate elastic strips of less longitudinal length than the circumference of said tubular section which are by means secured to the inner circumference at each throat in the stretched condition such that when the elastic is relaxed, a plurality of successive gathers extends circumferentially at each throat forming between them a storage compartment and adjacently on each extremity of said tubular section infundibuliform orifices, with forward facing semi-elliptical perimeters;

whereby said elastically constricted throats allow for ease of insertion and removal of the ball while at the same time providing a secure compartment for containing the ball.

4,416,405

CAMERA BODY TIE DOWN AND QUICK RELEASE DEVICE

Jerome P. Caillouet, 213 Myrtle Grove Dr., Donaldsonville, La. 70346

Filed Jul. 19, 1982, Ser. No. 399,893
Int. Cl.³ A45F *5/00*
U.S. Cl. 224—257 **6 Claims**

1. For use with a camera having an around the neck support strap connected to rings at each end of the camera; a camera tie down/quick release strap adapted to hold the camera against the chest of the wearer in a carrying position and permitting quick selective eye level positioning of the camera in a shooting position without detaching the camera from being secured to the body, comprising:

(a) a U-shaped strap means having camera attaching means at each of its ends and being adapted to pass over and beneath the camera without interfering with or blocking the camera lens opening,

(b) a body tie down quick release strap carried by the loop portion of said U-shaped strap foldable back upon itself, and

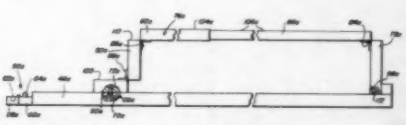
(c) means for attaching and releasing the foldable back upon itself portion of the quick release strap for providing the quick release and the body tie down.

4,416,406

VEHICLE LUGGAGE CARRIER

Harry V. Popency, 18136-45 Oxnard St., Tarzana, Calif. 91356

Filed Dec. 10, 1981, Ser. No. 329,289
Int. Cl.³ B60R *9/04*
U.S. Cl. 224—314 **8 Claims**



1. In a vehicle having a luggage supporting surface and a luggage carrier means connected thereto, the improvement which comprises a luggage rack assembly comprising, in combination:

(a) a spaced parallel pair of longitudinally extending raised side rails slideably disposed in parallel rail tracks secured to said luggage supporting surface; and,

(b) a spaced parallel pair of longitudinally extending sub-assemblies disposed between said side rails, each said sub assembly comprising, in combination,

i. an elongated rack track,

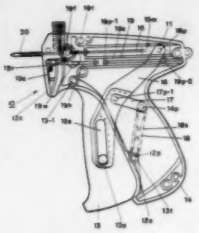
ii. an elongated luggage retainer keyed to said rack track having a portion thereof moveable between a collapsed flat storage position generally parallel to said rack track and on operative raised luggage engirdling position spaced above said rack track.

4,416,407

DISPENSING OF FASTENERS WITH A PIVOTED AND DISENGAGEABLE FEED MECHANISM

Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Nov. 2, 1981, Ser. No. 317,218
Int. Cl.³ B25C 5/11
U.S. Cl. 227—67 17 Claims



1. Apparatus for dispensing fasteners comprising
a device for receiving an assemblage of fasteners;
means for feeding the fasteners received by said device; and
a pivoting linkage having two separate pivot points at opposite ends of said link for controlling the feeding means;
wherein the feeding means includes a reciprocal slide and a feed pawl pivotally connected to respective opposite ends of said link at said separate pivot points;
said slide includes spaced apart projections which are successively engaged during the feeding of said fasteners; and
said projections are engaged by a lever which is operated by a trigger of said device.

4,416,408

SOLDER REMOVING DEVICE

Ernst Spirig, P.O. Box 160, CH-8640 Rapperswil, Switzerland

Filed May 22, 1981, Ser. No. 266,324
Int. Cl.³ B23K 1/00
U.S. Cl. 228—19 7 Claims

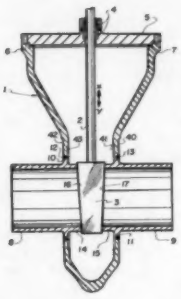
1. A solder removing device, comprising
(a) an open-mesh structure including at least one strand and being formed by knitting, weaving, stranding, braiding or crochetting,
(b) adjacent sections of said strand being in non-contiguous relation thereby defining open spaces for absorbing molten solder,
(c) at least the surface portion of said strand being metallic and receptive to solder flux,
(d) said surface portion being coated with solder flux to render it more capable of wetting with molten solder.

4,416,409

METHOD FOR MANUFACTURING A METAL CASING FOR GATE VALVES USED IN NUCLEAR REACTORS AND THE LIKE

Erwin Müller, Herdecke; Bernd Kollmann, Witten-Stockum; Ferdinand Sonnabend, Dortmud; Gert Petzolt, Nordkirchen; Josef Balz, Castrop-Rauxel; Bernhard Walloschek, Witten-Stockum, and Friedrich Risse, Bochum-Querenburg, all of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Division of Ser. No. 87,950, Oct. 25, 1979, Pat. No. 4,319,736.
This application Nov. 6, 1980, Ser. No. 204,545
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847579
Int. Cl.³ B23K 28/02
U.S. Cl. 228—173 R 1 Claim



1. A method of manufacturing a forged metal casing for accessories which can be employed in installations requiring high safety measures and which must be tested with a testing device and using a die, comprising the steps of introducing a bloom into the die and using a mandrel to hot-work the bloom so as to form it into a tubular body having open end and a closed opposite end, inserting a tool having both a rectangular cross-sectional portion and a cylindrical cross-sectional portion into the tubular body, and hot-working the tubular body so as to deform it at at least two diametrically opposed sides thereof to form interior planar surfaces of the planar wall portions thereof with the cylindrical portion of the tool bearing against the cylindrical portion of the tubular body at a location spaced from said planar wall portions, forming a port in at least one of the wall portions having a diameter less than that of the width of the at least one wall portion to leave a planar approach area therearound, and connecting a pipe connection to the port with a welding seam in a manner so that the test device can be used to test the welded seam and the boundary between the welded seam and at least one wall portion.

4,416,410

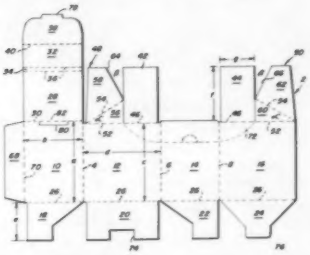
SANDPAPER ROLL DISPENSER

Ronald S. Herrmann, 3353 Polk St., N.E., Minneapolis, Minn. 55418

Filed Jun. 3, 1982, Ser. No. 384,474
Int. Cl.³ B65D 5/08, 5/54
U.S. Cl. 229—38 10 Claims

1. A paperboard blank for forming a dispenser for rolls of sandpaper or the like, comprising
(a) a rectangular blank (2), containing first (4), second (6), and third (8) spaced vertical fold lines for defining rear (10), first side (12), front (14), and second side (16) walls, respectively;
(b) rear (18), first side (20), front (22), and second side (24) wall bottom flaps connected by horizontal fourth fold lines (26) with the lower edges of said rear, first side, front and second side walls, respectively;

(c) a rectangular rear wall top flap (**28**) connected at its lower edge by a horizontal fifth fold line (**30**) with the upper edge of said rear wall;
(d) a rectangular rear wall top locking member (**32**);
(e) horizontal sixth fold means (**36**) connecting said rear wall top locking member with the upper edge of said rear wall top flap;
(f) a rear wall top locking flap (**38**) connected by a horizontal seventh fold line (**40**) with the upper edge of said rear wall top locking member;
(g) first (**42**) and second (**44**) rectangular side wall top flaps connected by horizontal eighth fold lines (**46**) with the upper edges of said first and second side walls, respectively, each of said first and second side wall top flaps having a width (g) that is less than the associated side wall, said side wall top flaps being adjacent the fold lines defining said front wall, respectively, whereby said first and second side wall top flaps are spaced from the vertical edges of said side walls remote from said front wall, respectively; and
(h) first (**48**) and second (**50**) side wall top members connected by horizontal ninth fold lines (**52**) with the upper edges of said first and second side walls adjacent the vertical edges of said side walls remote from said front wall, respectively, each of said side wall top members containing angularly arranged tenth fold lines (**54**) each extending from the corresponding vertical edge of said side walls remote from said front wall at an acute angle (α)



relative to the top edge of the associated side wall, thereby to define in each side wall top member a triangular first portion (**56**, **60**) connected with the associated side wall and a second portion (**58**,**62**), the generally, vertical edge of said second portion adjacent the associated side wall top flap being relieved and angularly arranged at an acute angle (β) relative to the adjacent vertical edge of the associated side wall top flap,

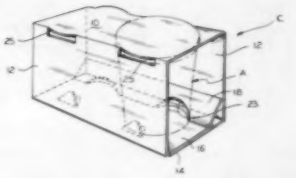
whereby when said rear, first side, front, and second side walls are folded inwardly about said first, second, and third fold lines to form a hollow tube having a rectangular cross-sectional configuration, when said first side, rear, front, and second side wall bottom flaps are folded upwardly about said fourth fold lines to positions normal to their associated walls, when said first and second side wall top flaps are folded downwardly about said eighth fold lines to positions normal to their associated walls, when said first and second side wall top members are folded downwardly about said ninth fold lines to positions normal to their associated walls, when said rear wall top flap is folded downwardly about said fifth fold line to a position normal to said rear wall, and when said rear wall top locking flap is folded downwardly about said seventh fold line to a position normal to said rear wall top flap, the dispenser is in a closed shipping condition; and when said rear, first side, front, and second side walls are folded inwardly about said first, second and third fold lines to form a hollow tube having a rectangular cross-sectional configuration, when said first side, rear, front, and second side wall bottom flaps are folded upwardly about said fourth fold lines to positions normal to their associated walls, when said second portions of each of said first and second side wall top members are folded downwardly about said tenth fold lines, respectively, when said rear wall top flap is folded downwardly about said fifth fold line to a position in contiguous relation with said first and second side wall top member second portions, and when said rear wall top locking member is folded downwardly about said sixth fold means to a position parallel to and spaced from said rear wall top flap with said first and second side wall top member second portions arranged therebetween, the dispenser is in its dispensing condition.

4,416,411

SLEEVE-TYPE CARTON FOR TAPERED ARTICLES

John D. Desmond, Philadelphia, Pa., and B. Mesquida-Feirman, Forest Hills, N.Y., assignors to Container Corporation of America, Chicago, Ill.

Filed Jun. 10, 1982, Ser. No. 387,018
Int. Cl.[3] **B65D** *5/02, 65/10, 75/06*
U.S. Cl. 229—40 **1 Claim**



1. A sleeve-type carton, for enclosing at least two articles which are tapered throughout substantially their entire height, said carton being formed of a unitary blank of foldable sheet material, such as paperboard, and comprising:
(a) pairs of opposed top and bottom and side walls foldably interconnected to form a rectangular, tubular structure open at the ends;
(b) said side walls being parallel to each other throughout their height and having, adjacent the upper edges thereof, openings for receiving the upper portions of said packaged articles and preventing the movement thereof within said structure;
(c) said bottom wall being joined to said side walls at corners which are uninterrupted throughout their length;
(d) said bottom wall including:
(i) tabs projecting upwardly therefrom for engagement with a lower portion of said articles to prevent the movement of said articles toward a side wall of said structure;
(ii) an internal panel sloping upwardly toward an adjacent side wall and presenting an opening for receiving lower portions of said article and preventing the movement of said articles toward an end of said structure.

4,416,412

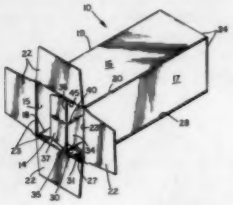
COLLAPSIBLE CARTON WITH INTERIOR PARTITIONS

Henry Wischusen, III, Lilburn, Ga., assignor to Rock-Tenn Company, Norcross, Ga.

Filed Jul. 12, 1982, Ser. No. 397,660
Int. Cl.[3] **B65D** *5/36, 5/48*
U.S. Cl. 229—41 R **11 Claims**

1. A carton formed from a flat blank of paperboard or the like, comprising:
foldably interconnected side panels defining a carton chamber having an open end;
partition panel means extending across said chamber and foldably connected to two glue panels affixed to opposing side panels of said carton, said partition panel means being located adjacent to said open end of said carton chamber;

fold-away panel means defined in one of said glue panels, said fold-away panel means being foldably connected to said partition panel means and foldable away from the remainder of said glue panel to permit said partition panel means to collapse from an erect position blocking said open end of said carton chamber to a collapsed position



opening said carton chamber for the insertion of an article; and

locking flap means foldably connected to said partition panel means and extending outwardly therefrom, whereby said partition panel means is prevented from collapsing when said locking flap means is folded substantially perpendicular thereto.

4,416,413

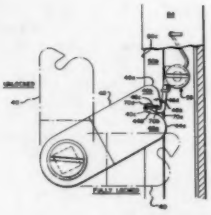
POST OFFICE LOCKER

Richard J. Chester, Kennedy, N.Y., assignor to American Locker Security Systems, Inc., Jamestown, N.Y.

Filed Oct. 28, 1981, Ser. No. 315,635

Int. Cl.³ B65D *91/00*; E05B *65/06, 11/00*

U.S. Cl. 232—24 **10 Claims**



1. A post office locker permitting delivery and safe storage until pick up of both letters and packages to tenants of a multiple tenant building or the like, which comprises in combination:

a plurality of letter boxes assigned one to each of said tenants and accessible only to the tenant to which it is assigned and to a mailman charged with the delivery of mail to said building;

at least one package storage cabinet sized to receive packages too large to be accommodated within said letter boxes and accessible only to a given tenant to which a package is to be delivered and to said mailman, said cabinet having a door and an access lock movable between door fully locked and unlocked conditions for permitting opening of said door to afford access to said cabinet by means of an access key made available by said mailman to said given tenant by placement of said access key in the letter box of said given tenant, said access lock permitting said access key to be inserted into and/or removed therefrom only when said access lock is in said door fully locked condition; and

latch means for maintaining said access lock in an intermediate door locked condition when said door is returned to closed condition and said access lock is moved from said door unlocked condition towards said door fully locked condition, and said latch means includes means under the control of said mailman for releasing said latch means to permit movement of said access lock from said intermediate door locked condition to said door fully locked condition.

4,416,414

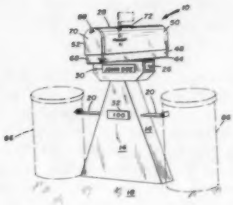
UTILITY YARD MARKER

Allen T. Edgerton, 135 Wilgate Rd., Owings Mills, Md. 21117

Filed Jul. 22, 1982, Ser. No. 400,898

Int. Cl.³ B65D *91/00*

U.S. Cl. 232—39 **9 Claims**



1. A marker device, having a utility for providing a plurality of functions, comprising:

a structural frame means;

a receiving compartment portion, said receiving compartment portion being located within said structural frame means and suitably affixed thereto at the upper end thereof, said receiving compartment portion being for receiving newspapers and other items and being a first utility component;

a covering means, said covering means being suitably affixed to the exterior of said structural frame means so as to enclose said structural frame means and said receiving compartment portion, said covering means having a suitable first aperture therein to provide access to said receiving compartment portion;

at least one securing means, said securing means being suitably affixed to said structural frame means and extending therefrom to the exterior of said covering means, a suitable second aperture being provided in said covering means for each securing means provided so as to project therethrough, said securing means being for the purpose of securing objects thereto and being a second utility component;

an internal storage area, said internal storage area being structurally formed by the permanently affixed enclosing covering means on said structural frame means and located therewithin, said internal storage area having a floor member therein, said internal storage area having a suitable third aperture provided in said covering means for access thereto, said internal storage area being for the storage of articles and being a third utility component;

identification means, said identification means being applied and affixed in position on the exterior of said covering means, said identification means being a fourth utility component;

a support plate means, said support plate means being suitably affixed to the topmost surface of said structural frame means; and

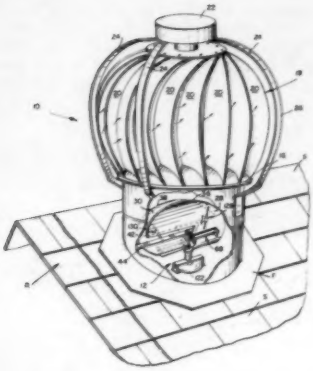
at least one expandable mail box means, said expandable mail box means being suitably affixed to said support plate means, said expandable mail box means being a fifth utility component.

4,416,415

AUTOMATIC DAMPER ASSEMBLY

Stanley Kolt, Mamaroneck, N.Y., assignor to Leonard W. Surloff, Jericho, N.Y., a part interest

Filed Oct. 20, 1981, Ser. No. 313,345
Int. Cl.³ F24F 7/06, 13/16
U.S. Cl. 236—49 26 Claims



1. An automatic temperature and pressure responsive damper assembly for use within the conduit of a ventilating system designed to exhaust air from a defined space into the atmosphere comprising:

a. mounting means for mounting said damper assembly within said conduit;

b. at least one vane movably mounted on said mounting means, said vane being movable between an open position wherein said vane permits the passage of air through said conduit and a closed position wherein said vane precludes the passage of air through said conduit;

c. means for opening said vane when the temperature of the air in said defined space reaches a predetermined level, said opening means including;

i. camming means having a camming surface thereon secured to said vane and being carried by said mounting means,

ii. a temperature responsive drive assembly mounted to detect temperature changes of the air in said conduit, said drive assembly being adapted to actuate in response to the temperature changes within a predetermined range, and

iii. transmission means operably extending between said drive assembly and said camming surface of said camming means for communicating movement of said drive assembly to said camming means such that said vane is moved to varying positions in response to temperature changes of the air in said conduit; and

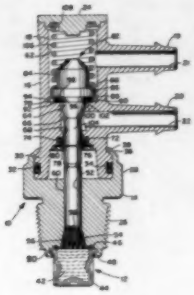
d. spring biasing means biasing said vane to said closed position and urging said camming means into contact with said transmission means, said biasing means opening said vane when there is a pressure differential of a predetermined magnitude between the end of said conduit in communication with said defined space and the end of said conduit in communication with said atmosphere, the pressure being greater at the end of said conduit in communication with said defined space.

4,416,416

TWO-PORT THERMALLY RESPONSIVE VALVE

Edgar W. Maltby, Elgin, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 235,179, Feb. 17, 1981, abandoned, which is a continuation of Ser. No. 93,704, Nov. 13, 1979, abandoned. This application Apr. 29, 1982, Ser. No. 373,187
Int. Cl.³ G05D 23/12
U.S. Cl. 236—86 11 Claims



1. A thermally responsive valve comprising:

housing means defining,

(i) first and second fluid ports,

(ii) a fluid chamber communicating with said ports,

(iii) tapered valve seat means, and

(iv) a seal engaging surface disposed within said fluid chamber intermediate said ports;

a valve member disposed within said housing for displacement between first and second positions for selectively establishing communication between said ports, said valve member defining,

(i) seal receiving means disposed within said fluid chamber,

(ii) a tapered valve surface engageable with said valve seat means when said valve member is in said first position to limit displacement thereof in one axial direction, and

(iii) a portion extending exteriorly of said fluid chamber;

a compliant seal carried with said valve member by said seal receiving means, and engageable with said seal engaging surface for limited axial compression of said seal when said valve member is in said first position, said seal being axially displaced from said seal engaging surface when said valve member is in said second position;

means biasing said valve member to said first position;

seal means disposed intermediate said exteriorly extending portion and said housing to effect continuous sealing engagement therebetween to fluidly isolate said fluid chamber; and

thermally responsive means engaging said exteriorly extending portion and operative to displace said valve member between said first and second positions in responsive to sensing predetermined temperatures,

said seal receiving means comprising an annular groove formed within said valve member, said groove defined by an upper transverse wall portion, a lower transverse wall portion, and a cylindrical surface portion connecting said upper and lower wall portions,

said compliant seal comprising a seal ring received in said annular groove and having a radial thickness substantially greater than the radial thickness of said lower transverse wall portion, and

said seal engaging surface including an annular shoulder extending inward radially beneath portions of said compliant seal ring such that in said first position, said compliant seal ring sealingly abuts thereagainst.

4,416,417

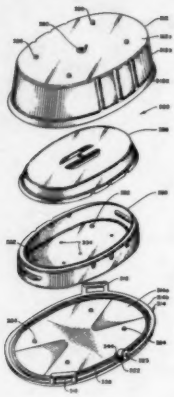
STERILIZED STORAGE CONTAINER

Roger S. Sanderson, 24772 Santa Clara, Dana Point, Calif. 92629, and Robert C. Wheichel, Newport Beach, Calif., assignors to Roger S. Sanderson, Dana Point, Calif.

Continuation of Ser. No. 172,421, Jul. 25, 1980, Pat. No. 4,374,570, which is a continuation-in-part of Ser. No. 895,239, Apr. 10, 1978, Pat. No. 4,247,517, which is a continuation-in-part of Ser. No. 821,042, Aug. 1, 1977, Pat. No. 4,251,482, which is a continuation-in-part of Ser. No. 734,228, Oct. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 703,044, Jul. 6, 1976, Pat. No. 4,196,166, which is a continuation-in-part of Ser. No. 640,824, Dec. 15, 1975, abandoned. This application Feb. 12, 1982, Ser. No. 348,353

Int. Cl.³ G05D *27/00*

U.S. Cl. 236—92 R **8 Claims**



1. An article of manufacture comprising:

means defining an expandable chamber including wall means movable in response to gaseous pressure changes such that the chamber when closed will expand when the pressure within the chamber exceeds the pressure surrounding the chamber;

a valve in a wall of said chamber means which controls fluid flow into the otherwise closed chamber including temperature responsive means which is responsive to the temperature of the fluid flowing into the chamber to close said valve at a predetermined temperature to capture a quantity of the fluid in the chamber.

4,416,418

FLUIDIZED BED RESIDENTIAL HEATING SYSTEM

Stephen L. Goodstine, 691 Kennedy Rd., and Brian C. Jones, 258 Mountain Rd., both of Windsor, Conn. 06095

Filed Mar. 5, 1982, Ser. No. 354,151

Int. Cl.³ F24H *1/22*; F22B *1/00*

U.S. Cl. 237—19 **2 Claims**

1. A fluidized bed combustion system for residential or industrial building heating comprising:

a. a combustor having a chamber, said combustor being uncooled and insulated so as to provide a substantially adiabatic combustion chamber;

b. a bed of highly abrasive inert refractory particles disposed within the combustion chamber;

c. means for supplying an ash bearing particulate fuel to the bed of highly abrasive inert refractory particles for combustion therein to generate hot flue gas;

d. an inlet air plenum disposed beneath the combustion chamber and connected to an air supply;

e. a flue for venting the flue gas generated in the combustor to the atmosphere;

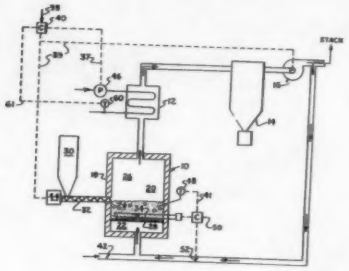
f. a heat exchanger disposed in the flue downstream with respect to gas flow of the combustor;

g. means for circulating a heat transfer fluid first through the heat exchanger in heat exchange relationship with the hot flue gas thereby cooling the flue gas and heating the heat exchange fluid and thence through the building to heat the building;

h. a particulate collector disposed in the flue downstream of the heat exchanger and for removing any ash particles entrained in the cooled flue gas;

i. a gas duct interconnecting the inlet air plenum with the flue at a location downstream of the particle collector;

j. an induced draft fan disposed in the flue at a location downstream of the connection of the gas duct to the flue for drawing the flue gas through the flue and causing a portion of the flue gas to flow to the inlet air plenum and be drawn



upwardly therefrom with air through the combustion chamber to fluidize the inert particles and the ash bearing particulate fuel therein;

k. damper means disposed within the gas duct and selectively positionable therein for regulating the flow of recirculated flue gas to the inlet air plenum;

l. means for positioning said damper means within the gas duct so as to regulate the flow of recirculated flue gas so as to maintain the temperature of the particulate bed below the ash softening temperature of the ash bearing particulate fuel; and

m. an electric heating means disposed within the combustion chamber of the combustor and immersed within the particulate bed therein for maintaining the temperature of the bed above the ignition point temperature of the ash bearing particulate fuel during periods in which fuel is not being supplied to the combustor.

4,416,419

RAILWAY BED

Ietatsu Ohno, 1-2, 1-chome, Kasuya, Setagaya-ku, Tokyo, Japan

Continuation of Ser. No. 71,718, Aug. 31, 1979, abandoned. This application Jul. 24, 1981, Ser. No. 286,673

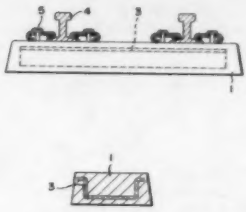
Claims priority, application Japan, Aug. 31, 1978, 53-106511; Feb. 15, 1979, 54-16503

Int. Cl.³ E01B *3/46*

U.S. Cl. 238—89 **1 Claim**

1. A railway bed adapted for reducing vibration pollution comprising an elastic member of a material from the class consisting of hard rubber and synthetic resins forming a tie extending longitudinally between and beyond the rails and located between the rails and ground surface, wherein a pair of rails is fitted on said elastic member, a single U-shaped reinforcing steel rigid member integrally molded in the lengthwise direction fully within said elastic member and separated thereby from metallic contact with the rails, said single member having a length to extend between and beyond the rails, thereby to reduce the vibrations of rail cars by shock absorption by the interacting combination of rails, the elastic member,

the rigidity of the rigid member and rail fastening means, said rail fastening means comprising a bolt or the like for mounting



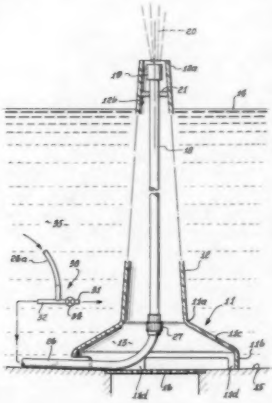
the rails directly on the elastic material embedded in said elastic material to extend between the open arms of the U-shaped member and toward the bottom thereof.

4,416,420

PORTABLE FOUNTAIN FOR POOLS OR SPAS

Stanley C. Thompson, 7851 Talbert St., Apt. 1, Playa del Ray, Calif. 90271

Filed Mar. 1, 1982, Ser. No. 353,370
Int. Cl.³ B05B *17/08*
U.S. Cl. 239—22 **8 Claims**



1. In a pool or spa portable fountain and in combination with the pool or spa, the combination comprising

(a) a pedestal and an upright tube supported by the pedestal, the pedestal adapted to be adjustably positioned on the bottom of the pool or spa so that the top portion of the tube projects above water surface level,

(b) a duct supported to extend upwardly within the tube, and a discharge head at the terminal of the duct to discharge water under pressure to form a fountain spray pattern,

(c) and a hose extending from a lower portion of the duct and via the interior of the pedestal to the exterior thereof, to receive a pressurized stream of water for delivery to the duct,

(d) the duct being relatively rigid and vertically elongated within the tube, and the hose being flexible and having connection with the lower terminal of the duct,

(e) the pedestal having generally bell shaped, hollow configuration, and the tube tapering upwardly from the pedestal, the pedestal and tube having one-piece, integral molded plastic construction, the bell shaped pedestal forming multiple support legs, the hose projecting between leg extents,

(f) and a flow divider including a tee connected with said hose, the divider having a discharge to the pool or spa, whereby part of the water supplied to the divider flows to the pool, and the remainder of the water supplied to the divider flows to the fountain via said hose, said divider including an adjustable control valve connected with said tee to adjust the flow of water to the pool to thereby increase or decrease the flow to the fountain,

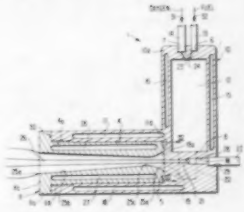
(g) the pedestal located over a drain in said bottom of the pool or spa, the pedestal opening downwardly.

4,416,421

HIGHLY CONCENTRATED SUPERSONIC LIQUIFIED MATERIAL FLAME SPRAY METHOD AND APPARATUS

James A. Browning, Hanover, N.H., assignor to Browning Engineering Corporation, Hanover, N.H.

Continuation-in-part of Ser. No. 196,723, Oct. 6, 1980, abandoned. This application Jul. 28, 1981, Ser. No. 287,652
Int. Cl.³ B05B *7/20*
U.S. Cl. 239—79 **17 Claims**



1. In a flame spray method comprising the steps of:

continuously combusting, under pressure, a continuous flow of an oxy-fuel mixture confined within an essentially closed internal burner combustion chamber,

discharging the hot combustion product gases from the combustion chamber through a flow expansion nozzle as a high velocity hot gas stream, and

feeding material to said stream for high temperature heat softening or liquefaction and spraying at high velocity onto a surface positioned in the path of the stream at the discharge end of the nozzle,

the improvement wherein the step of feeding said material comprises introducing said material in solid form outside of said combustion chamber and axially into a converging flow of hot combustion product gases after exit from the combustion chamber while entering a converging portion of the flow expansion nozzle having a nozzle bore of a length that is at least five times that of the nozzle bore throat, to restrict the diameter of the column of particles passing through the nozzle bore, to prevent build-up of particle material on the nozzle bore wall while insuring sufficient particle dwell time within the bore to effect particle heat softening or melting and flow at supersonic flow velocity prior to impact against said surface.

4,416,422

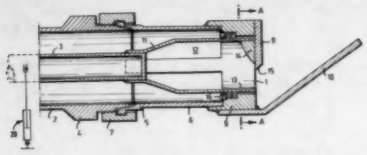
STEPLESSLY ADJUSTABLE DEVICE FOR INJECTING BLACK LIQUOR INTO A SODA DIGESTER

Valentin Tinnis, Espoo, Finland, assignor to Ekono Oy, Helsinki and A. Ahlstrom Osakeyhtio, Karhula, both of, Finland

Filed Jul. 1, 1981, Ser. No. 279,691
Int. Cl.³ B05B *1/32*
U.S. Cl. 239—455 **6 Claims**

1. A device for adjusting the flow quantity and drop size of black liquor to be injected into a soda digester, said device comprising a valve for adjusting a primary pressure of said

device, and an outflow opening the cross-sectional area of which is adjustable for adjusting the drop size, an outer pipe and inner pipe arranged coaxially rotatably inside said outer pipe and provided with openings for providing a flow connection between inner parts of said outer and inner pipes, the outer end of said outer pipe being provided with an end piece covering a part of the cross-sectional area of the outer end of said



outer pipe, which part is asymmetric as to the centre axis of said outer pipe, and the outer end of said inner pipe being provided with a nozzle piece covering a part of the cross-sectional area of the outer end of said inner pipe, which part is asymmetric as to the centre axis of said inner pipe, said outflow opening being formed by an opening which remains entirely free in the outer end of both pipes outside the areas covered by said end piece and said nozzle piece.

4,416,423

ELECTROMAGNETICALLY ACTUATABLE VALVE, IN PARTICULAR A FUEL INJECTION VALVE FOR FUEL INJECTION SYSTEMS

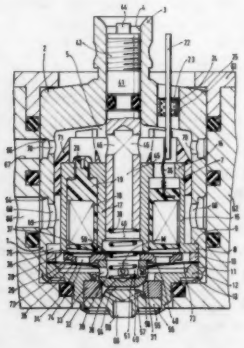
Rudolf Krauss, Stuttgart, and Udo Hafner, Lorch, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 30, 1981, Ser. No. 307,241

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046889

Int. Cl.³ F02M *51/00*

U.S. Cl. 239—585 **23 Claims**



1. An electromagnetically actuatable fuel injection valve for fuel injection systems of internal combustion engines, comprising a valve housing including a wall, a magnetic coil mounted on a core having a predetermined length and constructed of ferromagnetic material and a movable armature firmly connected with a valve element arranged to cooperate with a fixed valve seat with said valve element guided by means of a guide diaphragm clamped to said housing at its outer circumference, characterized in that said guide diaphragm includes a central guide opening forming an inner edge surface through which said valve element extends toward said valve seat, said guide diaphragm inner edge surface being arranged to surround said valve element in contact therewith to provide an axial guidance while preventing radial movement for said valve element, said guide diaphragm is spring tensioned on a concentric guide edge of said armature located on a side oriented toward said valve seat with said armature spaced from said guide diaphragm inner edge surface in contact with said valve element, said armature being relatively flat and oriented toward said valve seat, said guide diaphragm further arranged to guide said armature in a direction parallel to said valve seat and said core further having an end face extending radially outward of said flat armature and a compression spring for generating a closing force on said valve element.

4,416,424

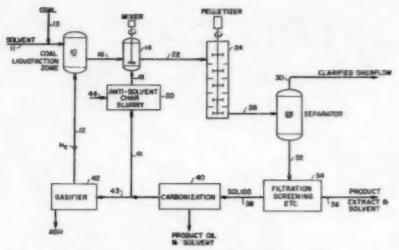
METHOD AND APPARATUS FOR DEASHING COAL LIQUEFACTION EFFLUENTS

Francis P. Burke, Bethel Park, Pa., assignor to Conoco Inc., Wilmington, Del.

Division of Ser. No. 933,359, Aug. 14, 1978. This application Aug. 31, 1981, Ser. No. 297,686

Int. Cl.³ B02C *19/00*

U.S. Cl. 241—101 B **10 Claims**



1. An apparatus for agglomerating and separating finely divided residual solids from liquid coal liquefaction product comprising:

(a) means for carbonizing a mixture of carbonaceous liquid and coal-derived solids at 450° to 525° C. (842° to 977° F.) to form carbonized solids, said carbonized solids being substantially larger than said residual solids,

(b) means for grinding said carbonized solids to form ground carbonized solids in the 325×28 mesh size range,

(c) means for providing a coal liquefaction product slurry,

(d) means for providing a precipitating solvent,

(e) means for adding ground carbonized solids consisting essentially of solids from step (b) and said precipitating solvent to said coal liquefaction product slurry, to form a separation mixture comprising (i) liquid coal liquefaction product (ii) liquid precipitating solvent (iii) residual solids, 95 percent of said residual solids being less than 10 micron in size and (iv) said added ground carbonized solids,

(f) means for agitating said separation mixture in an agitation means to form readily screenable pellets each said pellet being from 1 to 10 mm in size and thus substantially larger than said added ground carbonized solids, each of said pellets comprising a portion of said residual solids and a portion of said ground carbonized solids, said agitation means comprising

(i) an agglomerating vessel having an axis, a first and a second end and an inlet and an outlet;

(ii) at least one agglomerating zone co-axially positioned in said vessel, said zone having an outer diameter equal to the outer diameter of said vessel and a first end and second end, each of said first and second ends having an opening centrally positioned therein for charging materials to said zone and recovering materials from said zone;

(iii) an agitator means positioned in each of said zones, said stirrer means comprising at least one paddle means rotatably positioned in said zone so that said paddle means is rotated about a central axis of said vessel with an outer

edge of said paddle means defining an outer agitator diameter as said paddle means is rotated and with an inner edge of said paddle means defining an inner agitator diameter as said paddle means is rotated; and

(iv) means for rotating said paddle means; said outer agitator diameter being equal to at least one-half the outer diameter of said zone, the length of said zone between said first and second ends being equal to at least one-half said outer agitator diameter, said paddle means having a width measured parallel to said axis of at least one-fifth of said outer agitator diameter and a length measured perpendicularly to said axis equal to at least-half said width and said centrally positioned openings in said first and second ends having an outer diameter no greater than said inner agitator diameter,

(g) means for screening said pellets from said liquid coal liquefaction product whereby said liquid coal liquefaction product is separated from said residual solids, said residual solids comprising a portion of each of said pellets.

4,416,425

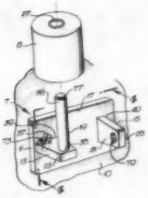
PAPER ROLL DISPENSER

Paul Kish, 15102 Kenoak Dr., Baldwin Park, Calif. 91706

Filed Apr. 20, 1982, Ser. No. 370,086

Int. Cl.³ B65H *19/00*

U.S. Cl. 242—55.2 **11 Claims**



1. A paper roll dispenser comprising:

bracket means adapted for attachment to a support surface;

first and second support arms extending generally in parallel from said bracket means;

a spindle extending from one end of said first support arm is a direction generally toward said second support arm and having a length sufficient to substantially span the distance between said support arms, said spindle being adapted for rotatably supporting a paper roll between said support arms, said first support arm being rotatably attached to said bracket means such that rotation of said first support arm moves said spindle between a first position spanning between said support arms and a second position swung clear of said second support arm; and

a stop tab protruding from said bracket means adjacent to said first support arm, said first support arm having an inboard face which cooperates with said stop tab to limit rotation of said first support arm when said spindle is in said second position.

4,416,426

WEB TREATMENT APPARATUS

Ronald C. E. Cooper, Brentwood, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Jul. 23, 1981, Ser. No. 285,902

Claims priority, application United Kingdom, Jul. 31, 1980, 8025120

Int. Cl.³ B65H *75/34, 19/04*

U.S. Cl. 242—56.9 **4 Claims**

1. Method of treating a roll of web material by use of a web treatment apparatus which comprises a web treatment section and a rotatable turret having at least three driven mandrels on which rolls of web material may be located, which method comprises placing a roll of web material on one mandrel of the turret, angularly displacing the turret to bring the roll of web material into a position from whence it can be unwound and passed into the web treatment section of the apparatus, unwinding the roll of web material and treating the first side of the web and rewinding the treated web on another mandrel of the turret, angularly displacing the turret to bring the roll into

a position from whence it can be unwound and passed into the web treatment section of the apparatus, unwindiang the roll of web material and treating the second side of the web, rewinding the web on another mandrel of the turret and angularly displacing the turret to bring the treated roll of web materials into a position from whence it may be removed from the apparatus and removing the treated roll from the apparatus.

4,416,427

SPINNING REEL FOR FISHING

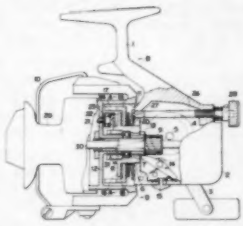
Hiroshi Kawai, Higashikurume, Japan, assignor to Daiwa Seiko Inc., Higashikurume, Japan

Filed Aug. 6, 1980, Ser. No. 175,895

Claims priority, application Japan, May 30, 1980, 55-74940

Int. Cl.³ A01K *89/01, 89/02*

U.S. Cl. 242—84.2 R **6 Claims**



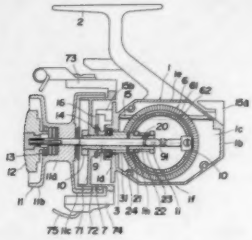
1. In a spinning reel for fishing including a housing provided at its upper part with an attaching member for attaching said housing to a fishing rod and carrying a rotary shaft having a handle; a rotor rotatably mounted on the front part of said housing and having a bail arm for retaining the fishing line, said rotor being adapted to be rotated in accordance with the rotation of said rotary shaft; and a spool provided at the front end of said rotor and adapted to make reciprocating motion in the axial direction in accordance with rotation of said rotary shaft, an improvement which comprises: a sleeve having a bent peripheral flange and formed at a front part of said housing so as to project into a recess formed in the rear part of said rotor; a braking disc fitted to a portion of said sleeve behind said sleeve and clamped by a frictioning braking member; a one-way engaging mechanism interposed between said braking disc and said rotor and adapted to disengage said braking disc from said rotor when said rotor is rotating in the forward direction and to make said braking disc and said rotor when said rotor is rotating in the backward direction; a leaf spring provided at the rear end of said frictioning braking member; and a manipulation rod mounted on said housing and extending in the axial direction of said spool, said manipulation rod being adapted to press said leaf spring.

4,416,428

FISHING REEL

Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jan. 5, 1982, Ser. No. 337,126
Claims priority, application Japan, Jan. 19, 1981, 56-5470[U]; Jan. 19, 1981, 56-5471[U]
Int. Cl.³ A01K *89/01*
U.S. Cl. 242—84.21 R **6 Claims**



1. A fishing reel comprising a reel body having a front wall and side walls, a rotary frame disposed in front of said front wall at said reel body, supported rotatably to said reel body, and having a tubular driven shaft, a spool disposed in front of the front wall at said reel body and having a spool shaft having at the outer periphery thereof a traverse groove, a handle supported to the side wall at said reel body, a transmission mechanism for transmitting rotation of said handle to said rotary frame, and a reciprocation mechanism for reciprocating said spool shaft longitudinally of said reel body, said transmission mechanism comprising a drive shaft having a master gear rotatable together with said handle and said driven shaft having a pinion engageable with said master gear, said master gear having at one side thereof a first annular toothed portion engageable with said pinion and a second annular toothed portion different in diameter than said first toothed portion, said reciprocation mechanism comprising said traverse groove provided at the outer periphery of said spool shaft, an association shaft having an association gear engageable with said second toothed portion at said master gear and being supported to said reel body only rotatably with respect to said spool shaft, and an engaging member supported to said association shaft and engageable with said traverse groove, so that said association shaft differs from said driven shaft in rotational speed, whereby the reciprocation of said spool caused by the rotation of said engaging member rotating together with said association shaft is not synchronized with respect to the rotation of said rotary frame.

4,416,429

WATER SKI TOW ROPE REEL APPARATUS

Donald W. Jessamine, 2341 S. Del Rio, Apache Junction, Ariz. 85220

Filed Jun. 29, 1981, Ser. No. 278,177
Int. Cl.³ B65H *75/34, 75/38, 75/40*
U.S. Cl. 242—86.5 A **5 Claims**

1. Reel apparatus for a two rope, comprising, in combination:

a rope;

housing means movable on the rope;

first aperture means in the housing means through which the rope extends;

second aperture means in the housing means remote from the first aperture and defining a slot through which the rope extends;

core means disposed within and secured to the housing means about which the rope is wound, including

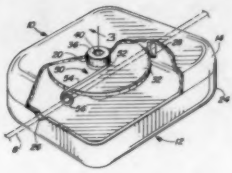
a core secured to the housing means, and

a guide plate secured to the core;

winding means for winding the rope about the core means including

a winding stem rotatable about the core means,

an arm secured to the winding stem and movable therewith,



a loop secured to the arm through which the rope extends, and

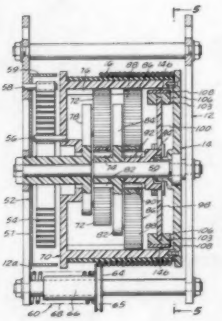
handle means for rotating the winding stem and the arm and the loop for winding the rope about the core means between the housing means and the guide plate.

4,416,430

LOAD LOWERING DEVICE

Roger Totten, Ventura, Calif., assignor to Draft Systems, Inc., Northridge, Calif.

Filed Feb. 1, 1982, Ser. No. 344,622
Int. Cl.³ B65H *75/48*
U.S. Cl. 242—107.3 **10 Claims**



1. A load lowering device comprising:

(a) a housing;

(b) interconnecting means for removably interconnecting said housing to a rigid support member;

(c) an axle extending transversely of said housing;

(d) a hollow drum mounted for rotation within said housing about said axle;

(e) a length of cable adapted to be uniformly wound about said drum upon rotation of said drum in a first direction and adapted to be paid out from said drum upon rotation of said drum in a second, opposite direction; said cable having an inner end disposed within said housing and having a free outer end;

(f) cable rewind means operably associated with said drum for yieldably resisting rotation of said drum in said second direction when said cable is paid out from said drum, said means being adapted to cause rotation of said drum in said first direction upon said cable being substantially paid out thereby causing said cable to be rewound upon said drum;

(g) guide means associated with said housing for guiding the travel of said cable with respect to said drum as said cable is rewound thereupon;

(h) braking means carried within said drum adapted to yieldably resist rotation of said drum in said second direction to

control the rate at which said cable is unwound from said drum, said braking means comprising:

(1) an internally toothed, annular shaped gear ring affixed to the inner surface of said hollow drum;

(2) a first support disposed within said hollow drum and affixed to said axle;

(3) at least one first planet gear rotatably carried by said first support and being adapted to engage said gear ring and be driven thereby as said drum rotates;

(4) an externally toothed first sun wheel rotatably carried by said axle and adapted to engage and be rotatably driven by said first planet gear;

(5) a second support rotatably carried by said axle within said hollow drum and affixed to said sun wheel for rotation therewith;

(6) at least one second planet gear rotatably carried by said second support and being adapted to engage said ring gear and be driven thereby as said drum rotates;

(7) an externally toothed second sun wheel rotatably carried by said axle and adapted to engage and be rotatably driven by said second planet gear;

(8) a governor mechanism rotatably carried by said axle and operably associated with said second sun wheel; and

(9) braking elements associated with said governor mechanism for actuation thereby upon rotation of said drum to bring said elements into pressural engagement with a braking surface provided internally of said drum; and

(i) load connecting means associated with said outer end of said cable for connecting said cable to the load to be lowered, said means including cushioning means for cushioning the impact forces imparted to said cable due to a limited free fall of the load with respect to the outer end of said cable subsequent to the interconnection of the load connecting means with the load.

4,416,431

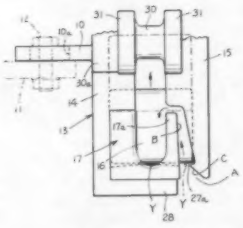
YARN TENSIONING DEVICE

Hans S. Singer, 191 Inglewood, Greenville, S.C. 29615

Filed Jul. 2, 1981, Ser. No. 279,843

Int. Cl.³ B65H *59/22, 59/26*

U.S. Cl. 242—151 **2 Claims**



1. A yarn tensioning device utilizing cylindrical rollers carried for rotation in a plurality of spaced longitudinally aligned upright receptacles in a housing having a depending member, said receptacles opening into a yarn passageway positioning said rollers transversely in rotating engagement with said yarn at spaced positions along said yarn passageway comprising:

a lateral threading passageway having an opening beneath said rollers adjacent an end thereof and on one side of said yarn passageway for feeding yarn into the yarn passageway;

an element carried by said housing defining said yarn passageway and having an upwardly extending yarn guiding surface extending upwardly forming one side of said opening of said lateral threading passageway below said rollers; and

an inwardly extending guiding member projecting beneath adjacent ends of said rollers carried by said depending member forming the other side of said opening;

whereby said guiding member insures the proper guiding of yarn for threading into said lateral threading passageway by positively positioning yarn beneath and requiring lifting of said adjacent ends of said rollers.

4,416,432

CASSETTE BRAKING MECHANISM

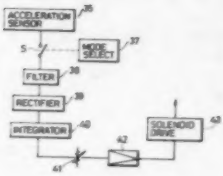
Masahiro Komatsubara; Tetsuro Kamimura; Takugi Inanaga, and Akira Takahashi, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,317

Claims priority, application Japan, Dec. 29, 1980, 55-187926[U]; Dec. 29, 1980, 55-187927[U]

Int. Cl.³ B65H *23/08;* **G11B** *15/43, 15/32*

U.S. Cl. 242—199 **10 Claims**



1. A cassette tape machine comprising:

at least one rotatable shaft member;

a hub coupled for rotation with said shaft member and having means for engaging a reel on a tape cassette, said reel rotating said hub in a supply direction when said reel acts as a supply reel;

means for detecting vertical vibration of said cassette tape machine; and

braking means for applying a predetermined braking force to said reel in response to said detected vertical vibration of said machine.

4,416,433

SIGNAL BALLOON DISPENSING APPARATUS

Joseph H. Bellina, 3949 Kabel Dr., New Orleans, La. 70114

Filed Jul. 13, 1981, Ser. No. 282,809

Int. Cl.³ B64B *1/50;* **H04B** *1/04*

U.S. Cl. 244—33 **10 Claims**

1. A self-contained signal balloon dispensing apparatus comprises:

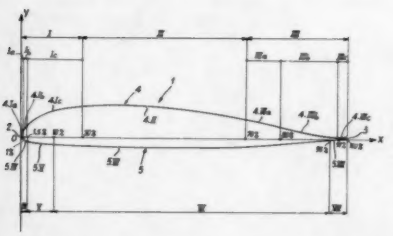
a. a lower case having a bottom and attached to enclosing side walls with an open top;
b. an upper lid assembly hingedly affixed to the lower case, at the open top, the lid assembly providing at least a pair of half enclosure sections, at least one of which provides a horizontal partition when in a closed position to at least partially seal the open top;
c. a vertical partition mounted within said lower case and dividing said lower case into two parts;
d. a shaft mounted within said lower case and attached at one end portion to said partition and at the opposite end portion to said side wall;
e. a dispensing spool wound with a length of tether line, rotatably mounted on the shaft;
f. a helium gas dispensing canister mounted in the lower case on the opposite side of the partition from the spool;
g. an inflatable balloon mounted within the case and connected to the canister;
h. trigger means including a gripping surface extending exteriorly of the lower case for actuating the canister to dispense helium into the balloon;
i. a signaling light source normally carried in one of the lid assembly half enclosure sections and attached to the balloon and to one end of the tether line, a horizontal baffle adjacent a portion of the open end of the lower case above the canister supports the light source and separates it from both the helium canister and the dispensing spool so that when the balloon is inflated, it is free to ascend without interference from light source, the spool, or the canister.

4,416,434

BLADE SECTION FOR ROTATING WINGS OF AN AIRCRAFT

Jean-Jacques Thibert; Anne-Marie Rodde, both of Verrieres le Buisson, and Jean-Marc E. Pouradier, Port-Saint-Louis-du-Rhone, all of France, assignors to Societe Nationale Industrielle Aerospatiale and Office National d'Etudes et de Recherches Aerospatiales, both of, France

Filed Aug. 17, 1981, Ser. No. 293,683
Claims priority, application France, Sep. 24, 1980, 80 20490
Int. Cl.³ B64C *3/10*
U.S. Cl. 244—35 R **14 Claims**



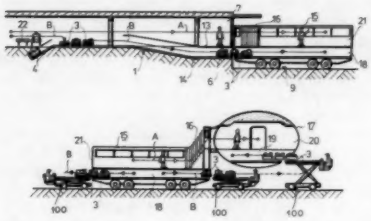
1. A blade section for a helicopter rotor blade comprising, between the leading edge and the trailing edge, a convex lower surface and an upper surface which is convex over the greater part of its length, but concave near the trailing edge, the upper surface comprising:
a first zone extending from the leading edge to not more than 30% of the length of the chord in the direction of the trailing edge,
said first zone comprising:
a first region in which the curvature of the surface has a maximum value at the leading edge and decreases rapidly toward the trailing edge;
a second region adjacent said first region in which the curvature is substantially constant, and
a third region adjacent said second region and extending to not more than 30% of the chord from the leading edge in which the radius of curvature decreases rapidly;
and a second zone adjacent said first zone and extending to at least 60% of the length of the chord from the leading edge in which the curvature of the upper surface is substantially constant.

4,416,435

BAGGAGE-HANDLING SYSTEM FOR AIRPORTS

Valer Szendrödi, and Karoly Gyurics, both of Budapest, Hungary, assignors to Ikarus Karosszeria es Jarmügyar, Budapest, Hungary

Continuation of Ser. No. 183,928, Sep. 3, 1980, abandoned. This application Dec. 17, 1982, Ser. No. 450,756
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1980, 3007130
Int. Cl.³ B64F *1/30, 1/31, 1/32*
U.S. Cl. 244—114 R **1 Claim**

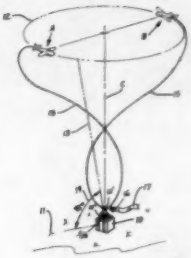


1. A baggage-handling system for luggage at an airport having a plurality of check-in stations for boarding passengers, a plurality of reception areas spaced from said check-in stations in one direction for passengers awaiting embarkation upon an aircraft, and a plurality of arrival areas for deplaning passengers preparing to leave the terminal, said system comprising:
a plurality of first transport tracks extending from said check-in stations to said reception areas in said direction;
a plurality of second tracks extending away from said arrival areas, said first and second tracks being mutually spaced and parallel to one another and forming part of a track network;
a transverse track forming part of said network interconnecting all of said first and second tracks;
a multiplicity of baggage carriers shiftable along said tracks and adapted to receive baggage at said stations and carry said baggage to said reception areas and for carrying said baggage away from said arrival areas;
an empty-carrier track extending across all of said fist and second tracks for transporting empty carriers from said second tracks to said first tracks at said stations, said first and second tracks having free ends at said areas spaced above grade whereby a transport vehicle can travel on grade to said areas for receiving and discharging baggage-laden carriers for said first tracks and said second tracks, respectively, the reception and arrival areas each being formed with passenger ramps at a level above that of the perspective tracks and parallel thereto; and above grade
a bus-type transport vehicle for receiving passengers from and delivering passengers to said ramps, said vehicle having a passenger compartment with a floor substantially in line with said ramps and a luggage compartment below said floor for receiving said carriers, said first and second tracks having other ends inclined downwardly away from said areas to said empty carrier track which is located below grade; and
a housing receiving said other ends of said first and second tracks and said empty-carrier track, said housing having an inclined apron covering said empty-carrier track.

4,416,436
AERIAL TRANSPORT OF PAYLOADS WITH VERTICAL PICK UP AND DELIVERY

Francis M. Wilson, Jr., Kennesaw, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Oct. 23, 1981, Ser. No. 314,254
Int. Cl.³ B64D 1/22
U.S. Cl. 244—137 R 8 Claims



1. In the aerial transportation of a payload the method of vertical pick up and delivery of such payload from a surface by two airplanes in flight comprising the steps of: flexibly connecting said payload to each said airplane while flying at substantially the same altitude and at a predetermined bank angle in a substantially circular first orbit around and above said payload; causing said airplanes to move at approximately the same speed and to be diametrically opposite one another while initially lifting said payload from said surface; causing one of said airplanes to reduce its bank angle while maintaining said speed whereby said one airplane describes a flight path at a radius approximately twice that of the other airplane and the two airplanes become positioned in side by side formation within approximately one circle of said other airplane with said payload trailing, between and below said airplanes; subsequently causing said airplanes to descend to a predetermined altitude above a selected delivery point for said payload with the airplane nearer to said point at a selected bank angle to locate it a predetermined distance to the side of said point and the airplane farther from said point at a selected bank angle to locate it approximately twice the distance from said point as, and trailing, said nearer airplane; causing said nearer airplane to increase its bank angle to commence a substantially circular second orbit around and above said point while simultaneously causing said farther airplane to commence a flight path approximately twice that of said nearer airplane, both airplanes moving at approximately the same speed; causing said farther airplane to gradually increase its bank angle so that it converges with the aforesaid circular second orbit of said nearer airplane at about the time said nearer airplane completes approximately one circle and the two airplanes become approximately diametrically opposite one another in said circular second orbit; and then causing the two airplanes to simultaneously descend while maintaining approximately the same speed until said payload reaches said delivery point.

4,416,437
SAFETY LOCK FOR A CARRYING AND JETTISONING DEVICE FOR LOADS TRANSPORTED UNDER AIRCRAFT

Jean H. Hasquenoph, Lagny, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, France

Filed Apr. 2, 1982, Ser. No. 364,588
Claims priority, application France, Apr. 3, 1981, 81 06750
Int. Cl.³ B64D 1/02
U.S. Cl. 244—137 R 3 Claims

1. In a carrying and jettisoning device for loads transported under aircraft, comprising:

suspension hooks for the load pivoted to movable supports and adapted to take an open position and a closed working position,

means ensuring a limited vertical movement of said supports,

fixed bearings adapted to be engaged by the load supported by the suspension hooks when said hooks are in an uppermost position, and

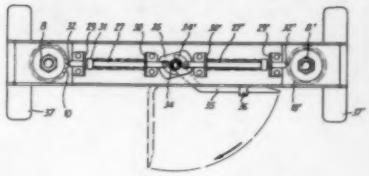
a system for locking said suspension hooks in their closed position and for controlling the opening of said hooks, which comprises a pivoted locking element adapted to hold said suspension hooks in their closed position;

a safety lock comprising:

a pivoted body,

a control member rigid with said pivoted body and adapted when actuated to pivot said safety lock body between a first position and a second position, and inversely,

a first extension rigid with said pivoted body and adapted, in said first position of said safety lock body, to cross the



path of the pivoted locking element of the suspension hook to prevent movement of said locking element in a direction allowing the locking system for the suspension hooks to be liberated and, in said second position of said safety lock body, to free said path of the pivoted locking element, and

a second extension rigid with said pivoted body, co-acting with movable members disposed in the vicinity of the means ensuring a limited vertical movement of the suspension hooks so that in said first positon of the pivoted body said movable members are removed from said means ensuring a limited vertical movement of the suspension hooks while, in said second position of the pivoted body, said movable members engage said means ensuring a limited vertical movement of the suspension hooks in order to prevent the actuation thereof and thus the vertical movement of the suspension hooks.

4,416,438
BOTTLE HOLDER

Sterling J. King, 311 Hillcrest Dr., Leucadia, Calif. 92024

Filed Feb. 20, 1981, Ser. No. 236,604
Int. Cl.³ A47B 15/00
U.S. Cl. 248—102 3 Claims

1. An infant's feeding bottle supporting apparatus comprising:

a suction cup for detachable attachment to a flat support surface and including an attachment knob,

an elongated flexible strap having a maximum length of

twenty-six inches secured at one end to said suction cup attachment knob,

adjustable loop means formed at the other end of said flexible member for detachably securing around the neck of a nursing bottle,

a bead secured to said other end and slidable on said flexible member for defining said adjustable loop means,

loop retaining stop means and safety stop means for defining the minimum and maximum sizes of said loop, and

said stop means comprising beads having throughbore and said flexible member extending through the bore.

4,416,439

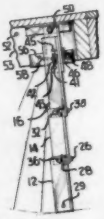
ADJUSTABLE LEG ASSEMBLY

Fred Dimpfel, 14100 Montfort Dr. #3260, Dallas, Tex. 75240; Steven J. Hahn, 127 Oberlin Ter., Lansdale, Pa. 19446; Brian J. Dyson, 7560 Taylor Rd., Riverdale, Ga. 30274, and Sandra F. Doyon, P.O. Box 603, Montross, Va. 22520

Filed Apr. 10, 1981, Ser. No. 253,152

Int. Cl.³ F16M *11/38*

U.S. Cl. 248—188.6 **12 Claims**



8. A load bearing support comprising a horizontally extending main body, at least one adjustable leg assembly depending from said main body, said leg assembly including a plurality of nestable segments, and means for pivotally interconnecting adjacent segments, wherein each of said segments comprises a pair of flat plates disposed at an angle of more than 90° with respect to each other.

4,416,440

INGOT MOLD AND METHOD

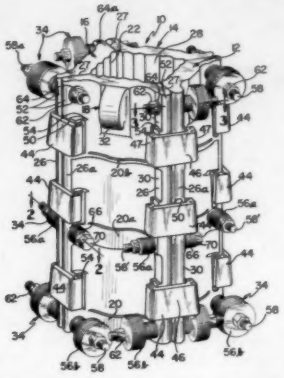
Harold M. Bowman, 18867 N. Valley Dr., Fairview Park, Ohio 44126, and Thomas P. Kicher, South Euclid, Ohio, assignors to Harold M. Bowman, Cleveland, Ohio

Continuation-in-part of Ser. No. 78,447, Sep. 24, 1979, Pat. No. 4,358,084, which is a continuation-in-part of Ser. No. 3,093, Jan. 15, 1979, Pat. No. 4,269,385, which is a continuation-in-part of Ser. No. 669,650, Jun. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 600,060, Jul. 29, 1975, abandoned. This application May 22, 1981, Ser. No. 266,382

Int. Cl.³ B22D *7/08*

U.S. Cl. 249—82 **28 Claims**

1. In a method for molding ingots comprising, providing a mold having side wall sections defining at least in part a generally vertically oriented mold cavity, the wall sections comprising generally vertically extending juncture surfaces adapted for opening and closing relative to one another resulting from the pouring of molten metal into the mold cavity and the resultant heating and subsequent cooling of the mold and associated ingot formed therein, clamping such juncture surfaces together by adjustable spring fastener means coacting between said wall sections and preloading said spring fastener means a predetermined amount so that said spring fastener means will provide sufficient clamping force to maintain said juncture surfaces in generally preloaded abutting condition until completion of the filling of the mold cavity to a predetermined extent with molten metal and the formation of an ingot skin on a poured ingot therein having sufficient structural integrity to support the molten interior of the ingot, said spring fastener means being operable to prevent leakage of molten metal between said juncture surfaces and to control stresses occasioned from the pouring of molten metal into the mold, said spring fastener means being applied to said mold to preload said juncture surfaces generally adjacent the upper and lower ends of said mold, said predetermined preload being



determined by combining the total force of fluid static loading with the total forces to restrict the free thermal deformation from the assembled mold wall sections occurring during the pouring of molten metal into the mold, in order to prevent leakage between the mold wall sections, said free thermal deformation being determined by the formula:

$$W = \frac{-3M_T}{4Eh^3}(x^2 + y^2)$$

wherein W represents the thermal bending deformation of the mold section, M_T is the thermal moment, x and y are respectively the x and y coordinates of the outermost corner of the mold wall section, E is the modulus of elasticity of the mold wall section and h is the thickness of the mold wall section, and then commencing the pouring of molten metal into the mold cavity and filling the latter to predetermined extent with molten metal, said spring fastener means upon completion of the filling of the mold to predetermined extent and formation of the said ingot skin, being operable to compress beyond the preloaded condition due at least in part to the thermal moment in said wall sections and permit controlled separation of said juncture surfaces, thus limiting the stresses applied to the wall sections during the metal pouring operation and resultant heating of the mold sections.

2. An ingot mold comprising one or more mold wall sections defining at least in part a generally vertically oriented mold cavity into which molten metal is adapted to be poured, spring fastener means coacting between adjacent sections for clamping the latter together along generally vertically extending juncture surfaces, said spring fastener means being operable to prevent leakage of molten metal between said juncture surfaces and to control stresses occasioned from the pouring of molten metal into the mold cavity and the resultant heating of the mold wall sections, and resisting separation of said juncture surfaces during the pouring operation and resultant heating of the mold, said spring fastener means including means for preloading said spring fastener means to a predetermined extent and with sufficient clamping force to maintain said juncture surfaces in a generally preloaded abutting condition until completion of the filling of the mold cavity a predetermined extent with molten metal and the formation of an ingot skin on a poured ingot therein having sufficient structural integrity to support the molten interior of the ingot, said spring fastener

means being capable of applying to said mold a predetermined amount of force to said juncture surfaces generally adjacent the upper and lower ends of said mold, said predetermined amount of force being determined by combining the total force of fluid static loading with the total forces for restricting the free thermal deformation from the assembled mold wall sections occurring during the pouring of molten metal into the mold, in order to prevent leakage between the mold wall sections, said free thermal deformation being determined by the formula:

$$W = \frac{-3M_T}{4Eh^3}(x^2 + y^2)$$

wherein W represents the thermal bending deformation of the mold section, M_T is the thermal moment, x and y are respectively the x and y coordinates of the outermost corner of the mold wall section, E is the modulus of elasticity of the mold wall section and h is the thickness of the mold wall section, said fastener means being operable to compress beyond the preloaded condition due at least in part to the thermal moment in said wall sections and permit controlled separation of said juncture surfaces so as to respond to the thermal deformation configuration of the ingot mold, thus limiting the stresses applied to the wall sections during the metal pouring operation and resultant heating thereof, said spring fastener means possessing memory and being adapted to return to substantially their preheated size condition after cooling thereof to cause said mold juncture surfaces to return to generally preloaded abutting relationship.

4,416,441

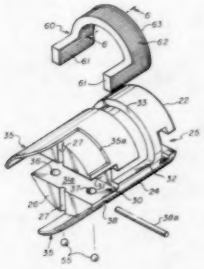
BLOWOUT PREVENTER

Denzal W. Van Winkle, P. O. Box 79737, Houston, Tex. 77079

Division of Ser. No. 89,180, Oct. 29, 1979, Pat. No. 4,392,633. This application Sep. 27, 1982, Ser. No. 423,561

Int. Cl.³ E21B *33/06*

U.S. Cl. 251—1 A **6 Claims**



5. A blowout preventer for sealing against an elongate member comprising:

a. a preventer body having a longitudinal bore therethrough with aligned tranverse bores intersecting the longitudinal bore;

b. ram bodies in said transverse bores with each ram body having a continuous groove that extends diametrically across the front thereof, along each side thereof and transversely over about half of each ram body between the groove on each side thereof;

c. closure means closing the outer ends of the transverse bores;

d. operating means for moving said ram bodies longitudinally of the transverse bores for sealably engaging an elongate member in the longitudinal bore and to close off fluid communication through the longitudinal bore, said operating means extending through said closure means;

e. an elastomer body with members embedded in the upper and lower surfaces thereof for fitting in that part of the groove extending diametrically across the front of each ram body;

f. recesses spaced longitudinally in said members;

g. positioning means positioned in each ram body and in the recesses in said members to retain said elastomer body in position in the groove extending diametrically across the front of each ram body;

h. an additional elastomer body for each groove portion extending along each side of the ram body, and transversely over about half of the ram body between the groove on each side of each ram body; and

i. a projecting lip on that portion of said additional elastomer body that fits in the groove portion which extends transversely over about half of the ram body between the groove portions on the side of each ram body.

4,416,442

METHOD AND APPARATUS FOR REMOVING SLAG

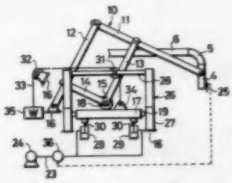
Soichi Hiroshima; Hidenao Hirasawa; Yoshinori Nakasai, and Keiichi Takayama, all of Muroran, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 363,771

Claims priority, application Japan, Apr. 10, 1981, 56-54198

Int. Cl.³ C21B *3/04*

U.S. Cl. 266—44 **4 Claims**



1. In a method of removing slag from a body of hot metal by applying a suction from a suction head and in which the suction head is supported in the desired position relative to the surface of the hot metal by a supporting means including a linkage means and movable for moving the suction head up and down relative to the hot metal, the step of holding the suction head in the desired vertical position by applying to the supporting means a constant upward force greater than the force with which the suction head is attracted downwardly by the weight thereof and the weight of the parts connected thereto, and, at the same time, applying to said supporting means a downward force sufficient to resist said upward force for thereby holding the said supporting means and said suction head at the desired vertical position against said upward force.

4,416,443

PROCESS AND APPARATUS FOR DETECTION OF THE STOPPAGE OF A TUYERE FOR BLOWING A GAS THROUGH THE BOTTOM OF A REFINING CONVERTER

Alfred F. Helfi, Thionville, and Jean-Claude H. Muller, Longeville-les-Metz, both of France, assignors to Societe Lorraine de Laminage Continu, Paris, France

Filed Jul. 14, 1982, Ser. No. 398,361

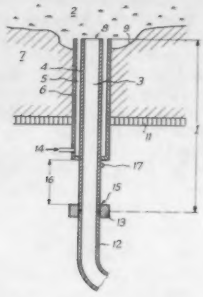
Claims priority, application France, Dec. 8, 1981, 81 22936

Int. Cl.³ C21B *7/16*

U.S. Cl. 266—47 **11 Claims**

1. A process for detecting stoppage of gas flow in a tuyere of a metallurgical bottom-blown converter having a refractory lining and a base plate, said tuyere extending through the base plate and the refractory lining, to blow, into and under a molten metallic bath in the converter, a gas compressed at a given pressure and delivered by the tuyere into the molten metallic bath at a pressure lower than said given pressure, said method

comprising measuring the temperature of the tuyere at a location below the base plate and detecting abnormal elevation of



the temperature of the tuyere indicating a stoppage in the gas flow in the tuyere.

4,416,444

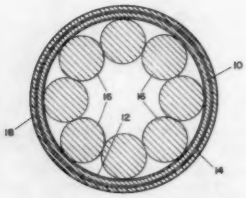
UNDERWATER CUTTING ROD

Jerome S. Brower, P.O. Box 1768, Pomona, Calif. 91769

Filed Mar. 28, 1983, Ser. No. 479,461

Int. Cl.³ B23K *9/18*

U.S. Cl. 266—48 **12 Claims**



1. An electrode for use in a cutting torch comprising a metallic tube coated on the inside and outside with a layer of conductive material, a plurality of rods within said tube, said rods selected from the group consisting of steel, aluminum, magnesium, titanium, tungsten, molybdenum or alloys thereof.

4,416,445

VISCOUS SPRING DAMPER

L. Dale Coad, Milan, Ohio, assignor to Imperial Clevite Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 950,949, Oct. 13, 1978, abandoned. This application Dec. 9, 1980, Ser. No. 214,771

Int. Cl.³ F16F *9/08*

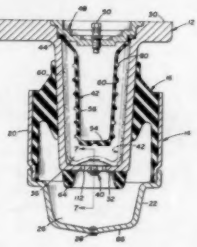
U.S. Cl. 267—35 **12 Claims**

1. A viscous spring damper having non-linear damping characteristics including a relatively soft damping characteristic over a selectable load range and a relatively high spring rate below the selectable load range, the damper comprising:

an outer member and an inner member connected by an elastomeric shear spring and defining a main fluid chamber therebetween which contains a fluid and has a main chamber volume, the outer and inner members being movable relative to each other such that the shear spring is stressed and the main chamber volume is varied;

a restricted orifice means for providing fluid communication between the main chamber and a second chamber defined by the inner member;

an expandable and contractible bladder which is selectively charged with gas to a selectable gas pressure independent of the fluid pressure by charging means for selectively varying the bladder's expandability and contractibility and causing it to be in contact with said inner member and said restricted orifice means in an unstressed condition, the bladder being disposed in said second chamber such that the bladder gas pressure controls the fluid pressure at which fluid flows from the main chamber through the orifice means into the second chamber, whereby under loads which cause a fluid pressure which is too small to



compress the bladder, the damper has a relatively high spring rate which is affected by the resiliency of the elastomeric shear spring and the compressibility of the fluid and whereby under loads which are sufficiently great to compress the bladder and cause fluid to flow from the main chamber into the second chamber, the damper has a relatively soft damping characteristic which is affected by the compressibility of the bladder and flow rates through the orifice means.

4,416,446

VIBRATION-ATTENUATING COUPLING DEVICE

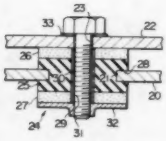
Masamitsu Murakami, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jul. 8, 1981, Ser. No. 281,363

Claims priority, application Japan, Jul. 25, 1980, 55-105786[U]

Int. Cl.³ F16F *3/08*

U.S. Cl. 267—140.3 **6 Claims**



1. A vibration-attenuating coupling device for use with a first member having inner and outer faces and formed with an opening having a center axis and a second member having inner and outer faces and formed with an opening having a center axis substantially aligned with the opening in the first member, comprising:

a laminar vibration absorptive structure securely fitted to said first member through the opening therein and having opposite end faces one of which is securely attached to the inner face of said second member, and

rigid fastening elements held in engagement with the other end face of the vibration absorptive structure and with the outer face of the second member through the opening in the second member,

said vibration absorptive structure comprising a first resilient member having opposite end faces and fitted to said first

member through the opening therein, a second resilient member secured between one end face of the first resilient member and the inner face of said second member and a third resilient member secured between the other end face of said first resilient member and one of said fastening elements, each of the second and third resilient members being smaller in spring constant than the first resilient member.

4,416,447

MACHINE FOR FORMING BOOKLETS OF INTERCALATED SHEETS

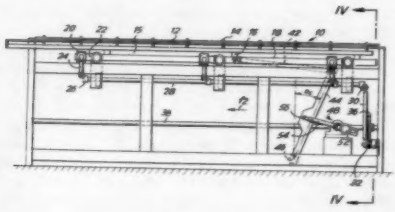
Romano Conti, Via Pier della Francesca 37, Prato, Firenze, Italy

Filed Sep. 3, 1981, Ser. No. 299,179

Claims priority, application Italy, May 14, 1981, 9413 A/81; May 14, 1981, 11646/81[U]

Int. Cl.³ B65H *39/02*

U.S. Cl. 270—54 **6 Claims**



1. A machine for the formation of booklets with intercalated multiple sheets, comprising:

means for forming a plurality of fixed seats each for a pile of sheets;

a main conveyor having a stationary longitudinal plane, a plurality of mobile longitudinal bars each with pegs forming a plurality of transfer seats means for a reciprocating displacement of said bars in a vertical direction from a position with said bars and pegs below said plane to a position with said bars and pegs above said plane and in a horizontal direction with respect to said stationary plane for advancing sheets in an advancement direction;

holding means for transferring individual sheets of each pile to said main conveyor;

a secondary conveyor operatively associated with at least one of said fixed seats for a pile of sheets having a greater thickness than sheets of other piles, operable to withdraw a lowermost sheet of the pile in said at least one fixed seat and to bring it to a holding position for said holding means, said secondary conveyor operable to move said sheets in a direction substantially transverse to the advancement direction from the pile at said at least one fixed seat to said holding position;

drive means for driving said secondary conveyor operatively coupled to said holding means and operating in synchronism with the transfer of a sheet from said holding position to said main conveyor, which successively receives the sheets of the booklet,

a frame carrying said main conveyor, said means forming a plurality of fixed seats and said secondary conveyor,

a support structure above said secondary conveyor for restraining all but a lowermost sheet of the pile in said at least one fixed seat from movement by said secondary conveyor in the direction transverse to said advancement direction; and

an adjustable bank movably mounted on said support structure for adjusting a distance between said secondary conveyor and said support structure to correspond to a thickness of sheets in the pile at said at least one fixed seat;

said holding means comprising a suction holder movable from said holding to said main conveyor;

said means for reciprocating displacement of said bars comprising a slide bar to which said bars with connected pegs are slidably mounted, first crank means connected to said slide bar for lifting and lowering said slide bar, an oscillating bar pivotally connected at one end to said bars and an opposite end to said frame, and second crank means connected to said oscillating bar at an intermediate location thereof for moving said bars and pegs in said advancement direction.

4,416,448

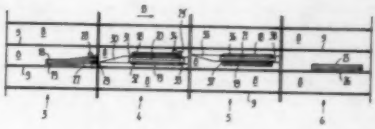
METHOD AND APPARATUS FOR THE INSERTION OF AT LEAST ONE INSERT OR SUPPLEMENT INTO PRINTED PRODUCTS

Jacques Meier, Bäretswil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Oct. 29, 1981, Ser. No. 316,435

Claims priority, application Switzerland, Nov. 17, 1980, 8496/80

Int. Cl.³ B65H *5/30*

U.S. Cl. 270—55 **16 Claims**

1. A method for stuffing at least one insert into printed products, especially for stuffing at least one insert into folded primary printed products wherein each printed product is composed of at least one sheet panel folded over on itself to present two planar outside surfaces, comprising the steps of:

bringing together at least two printed products in a superposed relationship, wherein the printed products are in side-by-side relationship with their outside surfaces juxtaposed one another;

moving said superposed printed products conjointly along a common processing path;

opening each superposed printed product during their conjoint movement along their processing path after the latter have been brought together in their superposed relationship; and

stuffing inserts into an opening of each printed product which has been opened.

4,416,449

DOCUMENT SEPARATING APPARATUS AND METHOD

George P. McInerny, Andalusia, Pa., assignor to Technitrol, Inc., Philadelphia, Pa.

Filed Dec. 9, 1981, Ser. No. 328,951

Int. Cl.³ B65H *3/52*

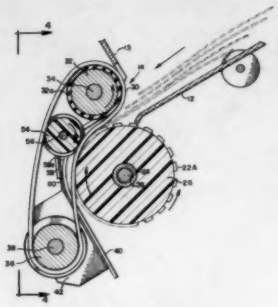
U.S. Cl. 271—122 **16 Claims**

15. The method of separating documents using a friction drum which is opposed by a counter-rotating stripper friction belt deflected over a non-friction surface slightly smaller than drum diameter intermediate the length of the drum axis comprising:

driving the drum in the direction of desired document flow;

driving the belt in the opposed direction;

guiding the documents by flanges of a free-wheeling pulley urged into the drum each side of the belt; and



feeding documents between the belt and the drum whereby the flanges of the free-wheeling pulley will hold the document against the drum to prevent skewing.

4,416,450

LETTER CONVEYOR SWITCH DRIVE

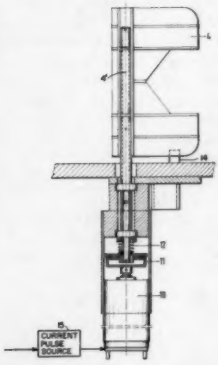
Hans van Wijngaarden, Leidschendam, Netherlands, assignor to Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie), The Hague, Netherlands

Filed Jun. 22, 1981, Ser. No. 276,022

Claims priority, application Netherlands, Jul. 2, 1980, 8003834

Int. Cl.³ B65H *29/60*

U.S. Cl. 271—303 **1 Claim**



1. A switching device for a letter-type conveyor having driven belts between which belts letters are conveyed one after the other from one direction to one of two alternate directions, said switching device comprising:

(A) a low momentum fast-acting switching tongue pivoted downstream on a shaft for oscillation between two stop positions for directing letters in one of said two alternate directions,

(B) a spring-urged friction clutch mounted on said shaft,

(C) a reversible low-momentum high torque electric rotary motor axially of said shaft and driving said clutch, and

(D) a source of a short driving current pulse for said motor having a duration slightly longer than the time to move said tongue between its two stop positions,

whereby said clutch will not slip on starting of said motor, but will slip and not bounce when said tongue is urged in one of its two stop positions.

4,416,451

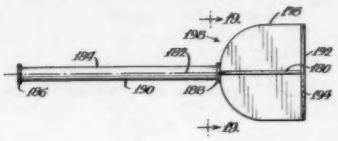
AQUATIC EXERCISE ASSEMBLY

Daniel S. Solloway, 1315 18th St., Woodward, Okla. 73801

Continuation-in-part of Ser. No. 79,966, Sep. 28, 1979, Pat. No. 4,311,306. This application Oct. 13, 1981, Ser. No. 310,788

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—116 **16 Claims**



1. An aquatic exercise assembly for use in water to strengthen muscles, improve muscle tone and enhance muscular coordination, comprising:

a generally impact-resistant water-engageable imperforate shaft formed of substantially water-impermeable material having a fin-engageable end portion and a manually grippable portion for being grasped under water adjacent said fin-engageable end portion, said shaft being elongated and extending in an axial direction along an axis, said manually grippable portion of said shaft having a maximum width defining a thickness taken in a radial direction generally transverse to said axis and said shaft being movable in said water; and

a plurality of water-engageable fins providing a hydrodynamic resistance assembly secured to and extending generally radially outwardly from each fin-engaging end portion of said shaft, said fins being substantially rigid to substantially avoid radial deflection and being angularly disposed with respect to each other for deflecting water and creating a pressure head and fluid resistance to water flow as said shaft is moved in said water, each of said fins having an axial engaging portion extending the entire length of each fin along said axis, said axial engaging portions of said fins directly secured to and touching each other in coaxial alignement with said axis of said shaft, each of said fins having a height extending from said axial engaging portion of an outer extremity of said fin substantially greater than the maximum thickness of said manually grippable portion of said shaft for enhanced hydrodynamic resistance, each of said fins having a solid, generally planar water-impingement surface lying in the axial direction and extending continuously across said fin from said axial engaging portion to said outer extremity with an imperforate, water-impervious cross-sectional area to provide a solid barrier in coplanar relationship and alignment with said axis to hydrodynamically engage said water and said rigid fins being positioned an effective distance from said manually grippable portion of said shaft for exerting a hydrodynamic torque on said manually grippable portion of said shaft as said shaft is being moved in said water to strengthen the muscles of the user of the exercise assembly.

4,416,452

BOWLING BALL FINGER GRIP INSERT

Donald L. Heimbigner, 802 Rhododendron Dr., Vancouver, Wash. 98661

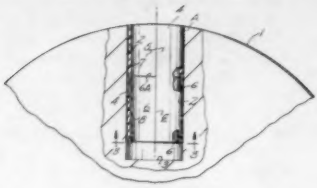
Filed Dec. 30, 1981, Ser. No. 335,603

Int. Cl.³ A63B *43/02*

U.S. Cl. 273—63 A **12 Claims**

1. A finger grip insert for bowling balls, said insert comprising,

a first finger engageable member of tubular shape for recessed securement within a bowling ball defined bore and having a truncated conical inner wall for contact with an inserted finger, a second finger engageable member formed integral with and inset within said first member



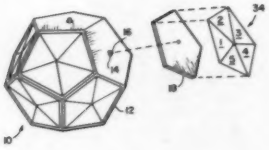
and of a resilient nature and being of greater resiliency than said first member for contact by the fingertip pad of the inserted finger, said second finger engageable member being inset within said first finger engageable member so as to provide an uninterrupted internal wall surface of the insert.

4,416,453

REGULAR SOLID MULTI-COLORED PUZZLE

Albert Sasso, 8 Rall Ct., Roseland, N.J. 07068

Filed Jun. 14, 1982, Ser. No. 387,921
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—155 **11 Claims**



1. A multi-colored puzzle, comprising:

a hollow, regular solid base;

a plurality of plates corresponding in number, size and shape to the faces of the regular solid base, and disposed on corresponding faces of the base;

means for coupling the plates in pairs, whereby the pairs of plates are rotatable relative to corresponding faces of the bsase;

the plates being divided into a plurality of triangles, with each plate having the same number of triangles and the triangles on any one plate having edges adjacent the edges of the triangles on adjacent plates;

the triangles being of different colors, and each plate having triangles of the same colors with the relative positions of triangles of a particular color varying in a predetermined order; and

the plates being rotated by a user of the puzzle in pairs relative to the corresponding faces until a discrete solution to the puzzle is achieved, whereby all of the adjacent edges of the triangles are of different colors.

4,416,454

MANAGEMENT TEACHING GAME METHOD

Robert P. Delamontagne, 284 Westcott Blvd., Pennington, N.J. 08534

Division of Ser. No. 73,200, Sep. 7, 1979, Pat. No. 4,289,313. This application Jul. 2, 1981, Ser. No. 279,776
Int. Cl.³ A63F *3/00*
U.S. Cl. 273- 243 **1 Claim**

1. A method of playing a management teaching game of the type including a game board having a first player territory representing the real-life work environment of a first player, a second player territory representing the real-life work environment of a second player, a path connecting said first and second player territories together and a plurality of player positions representing real-life work situations located along said path, said player positions having predetermined penalty and reward values, said game further including at least a first and second player piece, said method comprising the steps of:

determining the position of said first and said second player pieces by a random chance means so that said first and second player pieces are advanced by random amounts along said path;

posing identified questions and multiple choice answers to said identified questions alternately to said first and second players, said identified questions and multiple choice answers to said identified questions concerning specific subjects related to the real-life work of said first and second players;

answering said identified questions when said first and second player pieces are in said first and second player territories so that said first player answers questions when said first player piece is in said first player territory and said second player answers questions when said second player piece is in said second player territory;

indicating the correctness of any one of said identified multiple choice answers to any one of said identified questions posed during said posing step in such a way that more than one player knows if the question is correctly answered, but only the player performing the answering step knows the content of the multiple choice answer selected; and,

receiving a reward, said reward being directly dependent upon the cumulative number of correct answers given by a player to questions corresponding to the subject matter category of the player position in which an opponent player piece lands.

4,416,455

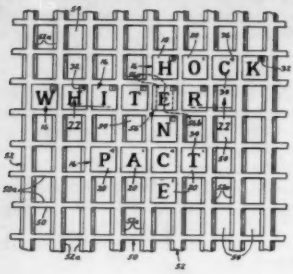
INTERLOCKING WORD GAME UTILIZING PRISMATIC BLOCKS AND METHOD OF PLAYING SAME

Leo J. Munson, Van Nuys; Felix Griauzde, San Pedro; David T. Okada, Manhattan Beach, all of Calif., and Bernard Loomis, New York, N.Y., assignors to CPG Products Corp., Minneapolis, Minn.

Filed Sep. 30, 1981, Ser. No. 306,989
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—272 **23 Claims**

23. A word game comprising a plurality of prismatic blocks, each having first, second and third acutely angled rectangular faces and parallel end faces having triangularly configured edges, said first and second faces each having a letter thereon, and a planar game board for holding said blocks, said game board having a plurality of elongated rectangular openings, the longer dimension of each opening corresponding to the distance between said triangularly configured end faces and the shorter dimension of each opening being less than the length of any of said triangularly configured edges, said game board

thereby holding said blocks so that said blocks are readily removable and holding said blocks so that only said selected first or second faces are visible, the shorter dimension of each



rectangular opening maintaining the first or second face of any block placed therein in a raised relation with respect to said planar board.

4,416,456

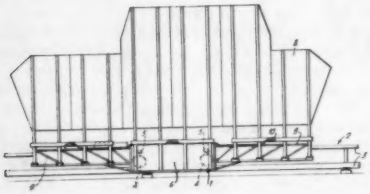
TROLLEYS FOR TARGET RANGES

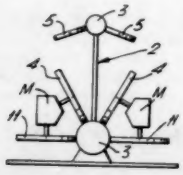
Lindsay C. Knight, Albury, Australia, assignor to Australasian Training Aids Pty. Ltd., Albury, Australia

Continuation-in-part of Ser. No. 967,770, Dec. 8, 1978. This application Apr. 28, 1981, Ser. No. 258,053

Int. Cl.[3] **F41J** *9/02;* **B61B** *13/06;* **E01B** *25/10*

U.S. Cl. 273—359 **17 Claims**





1. A trolley and a mono-rail track on which said trolley runs, said track comprising upper and lower elongate members extending one above the other in spaced parallelism, means for interconnecting said elongate members to provide a rigid track assembly, at least the lower elongate member having a periphery that is at least partially circular, said trolley comprising a chassis provided with an upper pair of jockey wheels which engage said upper elongate member on substantially opposite sides thereof and a lower pair of drive wheels which engage said lower elongate member, each of said lower pair of drive wheels being inclined upwardly and outwardly relative to said lower elongate member and serving to support the weight of the trolley, each of said lower drive wheels having a periphery which is concavely curved to provide intimate contact with the circular part of the periphery of said lower elongate member, the point of peripheral contact of said drive wheels being closer to the vertical axis of the track than the uppermost parts thereof, hydraulic motor means for driving said trolley, hydraulic circuit means for operating said hydraulic motor means, said hydraulic circuit means including means for controlling said motor means for braking effect, additional brake means adapted to engage at least said upper elongate member for further braking effect, and additional substantially horizontal wheels which engage side portions of said lower elongate member.

4,416,457

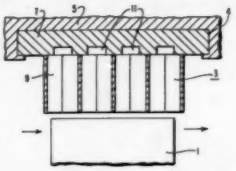
GROOVED HONEYCOMB LABYRINTH SEAL FOR STEAM TURBINES

Ralph E. McGinnis, Ridley Township, Delaware County, and Lewis Gray, Nether Providence, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 24, 1983, Ser. No. 460,693

Int. Cl.[3] **F16J** *15/44;* **F01D** *11/08*

U.S. Cl. 277—53 **7 Claims**



1. A honeycomb labyrinth seal cooperatively associated with rotatable steam turbine blades, said honeycomb seal comprising:

a base portion;

a plurality of rows of honeycomb cells extending radially inwardly from the base portion so that each cell is open adjacent said blade;

a plurality of passages so disposed that each cell is connected to at least one passage and at least one passage is open upstream of the rows of honeycomb cells and at least one passage is open downstream of said rows of honeycomb cells, thereby permitting steam to flow through said passages and cells from the upstream side to the downstream side of said honeycomb labyrinth seal.

4,416,458

MECHANICAL FACE SEAL WITH MINUTE PORES IN SLIDING SURFACE

Akira Takenaka; Keiichi Shimazaki, both of Nagoya, and Yasumitsu Kuwazuru, Toyota, all of Japan, assignors to Taiho Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 17, 1982, Ser. No. 419,575

Claims priority, application Japan, Sep. 18, 1981, 56-147244

Int. Cl.[3] **F16J** *15/20, 15/34*

U.S. Cl. 277—96.1 **1 Claim**

1. A mechanical seal comprising:

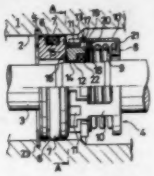
a fixed member to be fixedly attached to a stationary portion where sealing is required;

a rotary member to be fixedly mounted to a rotary shaft rotatably mounted in said stationary portion; and

means for pressing said rotary member against one axial side of said fixed member so as to slidably contact a sliding surface of said rotary member to a sliding surface of said fixed member;

one of said sliding surfaces being formed of a metallic material having a hardness of 350 and more than 350 in Vickers hardness system Hv and provided minute pores of not exceeding 30 μm in major diameter and from 100 to 270 per measuring length of 2.5 mm in number;

said number of minute pores being counted by scanning said sliding surface by means of a contact needle having a rounded tip of 2 μm in radius being equipped with a surface roughness measuring instrument, drawing measured roughness in magnified curve longitudinary by 20,000



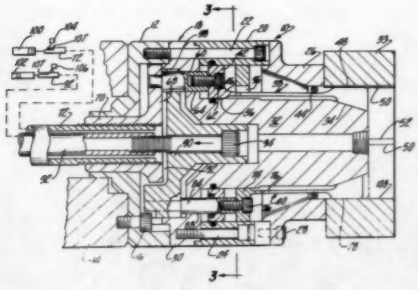
times and laterally by 100 times on a recording paper, drawing upper and lower peak count level lines in parallel to and apart by 0.25 mm in dimensions shown in the recording paper above and below the mean reference line in the magnified measured roughness curve on said recording paper and counting the number of pores assuming that there is one pore when said upper peak count level line intersects the magnified measured roughness curve at least once within two intersections between said lower peak count level line and said magnified measured roughness curve.

4,416,459

COLLET CHUCK FOR SPLINED WORKPIECES

Longine V. Morawski, 1497 Boston Blvd., Detroit 48206, and Lawrence V. Morawski, 38255 Fairway Ct., Apt. 82C Mt. Clemens 48044, both of Mich.

Filed Jun. 3, 1981, Ser. No. 270,146
Int. Cl.³ B23B 5/22
U.S. Cl. 279—2 R **9 Claims**



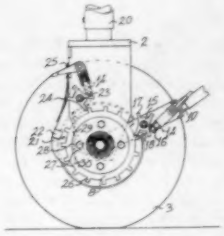
1. In combination, a chuck and a workpiece having a base diameter surface interrupted at regularly circumferentially spaced intervals by axially extending, radially projecting splines having radially facing surfaces, said chuck having a body, at least two collets supported on said body, each collet having a plurality of regularly circumferentially spaced fingers which extend axially forwardly on the chuck body and are radially resilient at their forward ends, each of said fingers having radially facing work-engaging surfaces at their forward ends, the fingers of the collets being interdigitally disposed circumferentially at their forward ends around a common circle so that the circumferentially adjacent work-engaging surfaces are associated with different collets, the circumferentially adjacent work-engaging surfaces being spaced apart circumferentially a distance at least slightly greater than the circumferential extent of the radially facing surface of each spline on the workpiece and the number of collets being related to the number of splines on the workpiece so that, when a workpiece is telescopically engaged with the collet fingers, the work-engaging surfaces of at most one of the collets will register radially with the radially facing surfaces of the splines and operating means for shifting each of the collets to the work-engaging and work-releasing positions, said means being operative to shift one collet to the work-releasing position in the event that the work-engaging surfaces thereof are not displaced radially a distance sufficient to engage the base diameter surface of the splined workpiece when the collet is shifted to the work-engaging position.

4,416,460

DRIVE MECHANISMS

Lionel G. Morris, 17 Ferguson Ave., Myrtle Bank, State of South Australia, Australia

Filed Apr. 2, 1981, Ser. No. 250,249
Int. Cl.³ B60K 9/00
U.S. Cl. 280—3 **4 Claims**



2. A traction jockey wheel comprising a support frame, a ground engageable traction wheel supported by the support frame for traction about a substantially horizontal axis and steering about a substantially vertical axis, a ratchet wheel co-axially secured to the traction wheel, a spring loaded pawl adjustably supported by a manually operable lever arm which is pivotally co-axially supported with respect to the traction wheel, and effective to cause a ratchet drive with respect to the ratchet wheel in either of a selected traction rotational direction, and a spring loaded pawl adjustably supported by the supporting frame and effective by engagement against the ratchet wheel to impede motion of the ratchet wheel in either of the selected rotational traction directions, braking means pivotally supported by the support frame and including an interlocking tooth, spring means arranged to urge the tooth into an interlocking braking position with respect to the ratchet wheel, and inter-engaging cam means between braking means and the lever arm arranged so as to hold the tooth from an interlocking braking position only when the lever arm is in a selected operating range of positions.

4,416,461

FUEL STORAGE VESSEL SUPPORTING STRUCTURE

Toshio Hayashi, and Isao Hayashi, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

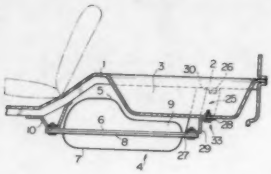
Filed Jan. 29, 1982, Ser. No. 343,928
Claims priority, application Japan, Feb. 10, 1981, 56-19269
Int. Cl.³ B60K 15/08
U.S. Cl. 280—5 A **2 Claims**

1. A fuel storage vessel supporting structure for supporting a fuel storage vessel of an automotive vehicle having a fore-and-aft direction, the fuel storage vessel having front and rear

end portions and the vehicle having a vehicle body structure, comprising:

a front bracket member rigidly interconnecting the vehicle body structure and the front end portion of said fuel storage vessel, and

a rear bracket member comprising a pair of fixed end portions bent horizontally and fastened to the vehicle body structure, a front weir-shaped portion downwardly depending from the fixed end portions and fastened to the rear end portion of said fuel storage vessel, a rear weir-shaped portion extending rearwardly of the front weir-shaped portion and downwardly depending from the fixed end portions, the rear weir-saped portion being shallower



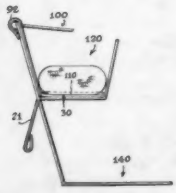
in depth than the front weir-shaped portion and gradually merging at the fixed end portions, an intermediate portion connecting together the front end rear weir-shaped portions and convergingly tapered toward and terminating at the fixed end portions for forming a pair of stress raising portions which are ready to be deformable, and fastening means for fastening said rear weir-shaped portion and said vehicle body structure and forwardly escapable together with said vehicle body structure from said rear weir-shaped portion and interconnecting the vehicle body structure and the rear end portion of said fuel storage vessel and partially deformable to permit the fuel storage vessel to be retained stationary.

4,416,462

REMOVEABLE CUSHION FOR A SHOPPING CART

Judith D. Thompson, 723 Dresden Dr., Newport News, Va. 23601

Filed Apr. 15, 1982, Ser. No. 368,554
Int. Cl.³ A47D *1/10*; A47C *4/30, 31/00*
U.S. Cl. 280—33.99 B **10 Claims**



1. In combination with a nesting shopping cart having a flat bottom, sloping sides, a raised handle portion at the rear of the cart, and a pivoted seat portion having leg holes adapted to receive a child's leg; a removable cushion device comprising;

an elongated cushioned segment having a flap member projecting from its free end,

an intermediate cushioned segment having smaller generally rectangular cushioned segments projecting from its sides, an end cushioned segment, and

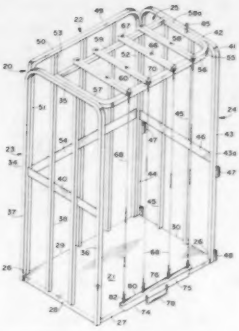
fastening means on said flap member and said elongated cushioned segment, which cooperate to releasably secure the removeable cushion device to, and provide a protective covering for the handle portion of the shopping cart.

4,416,463

BULK STORAGE CART

William E. Marsh, Jr. deceased, late of New Braunfels, Tex., and Elizabeth A. Marsh, executrix, 36 Guada Cono, New Braunfels, Tex. 78130

Filed Nov. 6, 1981, Ser. No. 318,919
Int. Cl.³ B62B *1/10*
U.S. Cl. 280—79.3 **14 Claims**



13. In combination with a bulk storage cart consisting of a base, opposing side walls, rear wall, and cross piece secured laterally to opposing upper side walls:

a plurality of tubular members secured to at least said cross piece,

a compression spring carried in each tubular member,

forward limit stop means for said spring in each tubular member,

spring compressing means associated with each spring,

means associated with the foremost end of each tubular member to change the direction of travel of said cable,

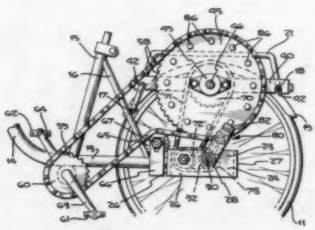
said cables and foot plate forming a gate for said cart.

4,416,464

SPRING ASSIST DRIVE FOR CYCLE

Robert G. Mattox, 4846 Radford, North Hollywood, Calif. 91607

Filed Sep. 8, 1981, Ser. No. 299,809
Int. Cl.³ B62M *1/10*
U.S. Cl. 280—215 **6 Claims**



1. A spring assist drive for a peddle operated vehicle of the cycle type which has a frame for a front steerable wheel and seat, a rear drive wheel assembly comprising a drive wheel sprocket with drive shaft, foot pedals on appropriate pedal arms and a power sprocket motivated by said pedals serving as parts of said vehicle of conventional structure and relationship, said spring assist comprising a spring cage on the frame, a spirally wound coil spring for said cage, said spring having an inner and an outer end, a spring power sprocket, a spring power shaft rotatably mounting said spring power sprocket on

said frame and a spring wind sprocket anchored to said cage at a location above and no further forward than said drive wheel sprocket, the location of the axis of rotation of said spring wind sprocket being spaced from the location of the axis of rotation of said drive wheel sprocket, said coil spring having the inner end fixed on said spring power shaft and the outer end attached to said cage adjacent the perimeter, an endless drive chain interconnecting said power sprocket with said spring wind sprocket, and a transfer chain means between said spring power sprocket and said drive wheel sprocket comprising a continuous permanent operating drive from said power sprocket whereby the energy built up in the spring has a continuously expendable auxiliary driving engagement with said drive wheel.

4,416,465

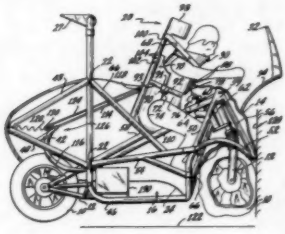
CRASH RESISTANT MOTORCYCLE

Tadeus Winiecki, San Diego, Calif., assignor to Martha Winiecki and Henry Winecki, both of Vancouver, Wash., a part interest

Division of Ser. No. 143,527, Apr. 24, 1980, Pat. No. 4,311,335. This application Dec. 8, 1980, Ser. No. 214,347

Int. Cl.³ B62J *27/00*

U.S. Cl. 280—290 **3 Claims**



1. In a motorcycle having two wheels in tandem, a frame interconnecting said wheels, a steering assembly for steering at least one wheel and a seat assembly for supporting at least one rider, the improvement wherein said seat assembly comprises:

a body restraint to hold the rider in the seat;

a shock absorber mounted rigidly to the motorcycle frame;

an actuating cable extending from said shock absorber to the back of said seat; and

a retraction system connected to the back of said seat urging said seat toward the normal position for use;

whereby said seat is movable forwardly in response to inertial forces upon frontal impact between the motorcycle and another object, with said shock absorber absorbing impact energy, with said retrieval system returning said seat to approximately the original position once impact energy has been absorbed.

4,416,466

TRAILER HITCH GUIDE

W. Sidney Park, 513 Morningside Dr., Louisville, Ky. 40206

Filed May 5, 1981, Ser. No. 260,754

Int. Cl.³ B60D *1/06*

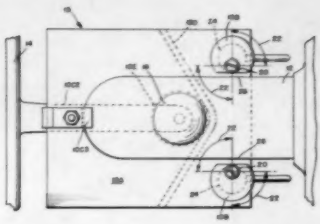
U.S. Cl. 280—477 **4 Claims**

3. A trailer hitch guide for guiding a towing ball on a towing vehicle into position with respect to a receiving means on a trailer tongue of a towed vehicle, comprising:

means for securing said guide on the trailer tongue of the towed vehicle; and

means for guiding the towing ball into position with respect to the trailer tongue whereby the towing ball is in alignment with the receiving means of the trailer tongue;

said securing means comprising stop means adjustably secured to said hitch guide and engageable with the endmost portion of the trailer tongue for longitudinally positioning said hitch guide on the tongue and for preventing



longitudinal movement of said guide with respect to the tongue.

4,416,467

TOWING COUPLINGS

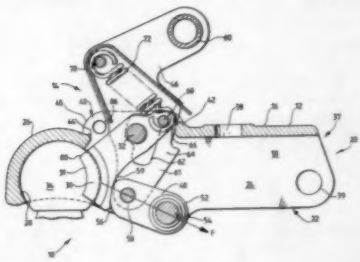
Harry S. Bradley, Bradford, England, assignor to H. & K. Bradley (Trailer Equipment) Limited, Bingley, England

Filed Aug. 31, 1981, Ser. No. 298,100

Claims priority, application United Kingdom, Sep. 6, 1980, 8028862

Int. Cl.³ B60D *1/06*

U.S. Cl. 280—512 **22 Claims**



1. A towing coupling for a trailer vehicle comprising:

a fixed part and a moveable keeper, which together are adapted to clamp on a tow ball when the keeper is in a locking position, but to release the tow ball when the keeper is in an unlocking position;

a cam engaged with the keeper;

single spring means urging the keeper away from the locking position and into engagment with the cam and also urging the cam in the direction of motion which causes it to apply a force to the keeper urging the keeper towards the locking position; and

lever means mechanically linked to the cam for moving the cam against the loading of the single spring means to allow the keeper to move away from the locking position.

4,416,468

PASSIVE SAFETY BELT SYSTEMS

Douglas J. Cunningham, Lutterworth, England, assignor to Britax (Wingard) Limited, United Kingdom

Filed Apr. 22, 1981, Ser. No. 256,477

Claims priority, application United Kingdom, Apr. 30, 1980, 8014199

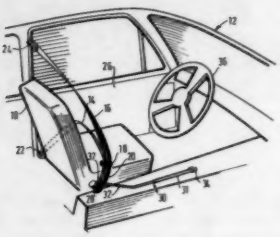
Int. Cl.³ B60P *7/04*

U.S. Cl. 280—802 **5 Claims**

1. A passive safety belt system in combination with a vehicle body having a front-hinged door and a seat located adjacent to said door, the system comprising:

a shoulder strap, a lap strap and a common strap interconnected to form a three point safety belt, the free ends of the shoulder and lap straps being connected to the rear end of the door in proximity to the top and bottom corners thereof and the free end of the common strap being guided, at a location inboard of and adjacent to the bottom of the back of the seat, on to an inertia reel;

a rigid arm formed in two relatively movable sections and pivotally mounted for angular movement about a pivot axis adjacent to the front inboard corner of the bottom of



the seat so that the free end of the arm is movable between a first position adjacent to the location at which the common strap is guided on to the inertia reel and a second position in front of and spaced from the chest of the occupant of the seat; and

means for coupling the free end of the arm to the safety belt;

the inboard end of the pivot axis, relative to the vehicle body, being above and in front of the outboard end thereof, so that, as the door is opened, the belt moves the arm from the first position to the second position and the belt is moved forwardly away from the occupant.

4,416,469

PASSIVE SAFETY BELT SYSTEM

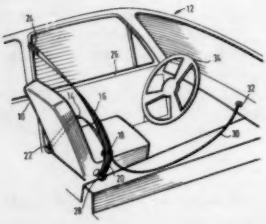
Douglas J. Cunningham, Lutterworth, and George G. Sanders, Polesworth, both of England, assignors to Britax (Wingard) Limited, Birmingham, England

Filed Apr. 22, 1981, Ser. No. 256,530

Claims priority, application United Kingdom, Apr. 30, 1980, 8014158; May 13, 1980, 8015857; Sep. 12, 1980, 8029601; Oct. 8, 1980, 8032288

Int. Cl.³ B60K *21/10*

U.S. Cl. 280—804 **8 Claims**



1. For use in a motor vehicle having a steering wheel, a fascia forward of the steering wheel and a seat located adjacent to a front-hinged door, a passive safety belt system comprising:

a shoulder strap, a lap strap and a common strap interconnected to form a three point safety belt;

anchorage means for the free end of the shoulder strap connected to the door in proximity to the top rear corner thereof;

anchorage means for the free end of the lap strap connected to the door in proximity to the bottom rear corner thereof;

anchorage means for the free end of the common strap incorporating an inertia reel and connected to a location on the vehicle inboard of, and adjacent to the bottom of the back of, the seat; and

puller means interconnecting a point on the safety belt which is inboard of the seat when the door is closed with a point on the vehicle which is forward of the seat in front of and above the normal position of knees of an occupant of the seat, said last mentioned point being forward of the steering wheel and closely adjacent to the fascia when the door is opened, so that, the force applied to the safety belt by the door, when it is opened, causes the puller means to apply a resilient force to the shoulder strap thereby to displace the junction between the lap, shoulder and common straps out of the plane containing said three anchorage means in a direction away from the seat.

4,416,470

DEVICE FOR OBTAINING ACCURATE REGISTRATION OF HANDWRITTEN IMPRESSIONS ON CONTINUOUS BUSINESS FORM SETS

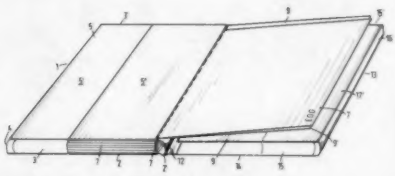
Siegfried Beck, Renningen, and Philipp Drescher, Stuttgart, both of Fed. Rep. of Germany, assignors to Drescher GmbH & Co. KG, Rutesheim, Fed. Rep. of Germany

Filed Dec. 18, 1981, Ser. No. 332,322

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049464

Int. Cl.³ B41L *5/02*; B42D *3/18, 19/00*

U.S. Cl. 281—7 **12 Claims**



1. A device for obtaining accurate registration of handwritten impressions on continuous business form sets, the latter being separable into individual form sets by means of longitudinally spaced transverse perforations that also permit zig-zag folding of the form sets into a stack, the individual form sets having predetermined planar dimensions, the device comprising:

receiving means for receiving a zig-zag folded stack of the continuous business form sets, said receiving means being a receiving pocket at least partially surrounding the zig-zag folded stack, said pocket having an opening facing in the direction in which the continuous form sets are pulled therefrom;

said pocket including: a base plate, a back wall connected to the base plate, mutually adjacent side walls also connected to said base plate, and a cover plate parallel to said base plate, said cover plate being connected to said back wall and said side walls to conjointly define therewith the pocket space for receiving the zig-zag folded stack therein;

said cover plate including a rear portion extending over only a part of said base plate, said side walls having respective edges facing away from said back wall, said wall edges, said cover plate and said base plate conjointly defining said opening, said pocket also including a flap-like front portion pivotally connected to said rear portion at said opening so as to extend in the direction in which the continuous business form sets are pulled from said pocket; and

registration means for registering and maintaining the form

sheets of a given form set in a predetermined spaced relationship to each other, said registration means including: a registration plate defining a writing surface whereon the form set is placed to receive the handwritten entry, and connection means for movably connecting said plate to said pocket; and,

said connecting means being an articulating hinge-like joint connecting said registration plate to said pocket so as to permit pivoted translation of said registration plate into and out of a position parallel to said base plate;

said registration plate being made of a stiff material and having substantially the same planar dimensions as an individual form set, said registration plate including an outer edge spaced away from said articulating hinge-like joint and said front portion too having an outer edge spaced away from the location whereat the same is connected to said rear portion, said front portion outer edge and said registration plate outer edge being parallel to each other.

4,416,471

COLOR-DEVELOPING SHEET FOR PRESSURE-SENSITIVE RECORDING SHEET

Noboru Yamato; Akira Hasegawa, and Ippei Shimizu, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1981, Ser. No. 320,731
Claims priority, application Japan, Nov. 12, 1980, 55-158215
Int. Cl.³ B41M *5/22*
U.S. Cl. 282—27.5 **16 Claims**

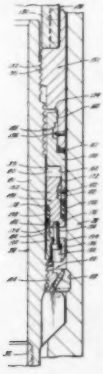
1. Color-developing sheet for a pressure sensitive recording sheet having a color-developing layer comprising an organic electronic acceptive color developing agent, calcium carbonate and acrylamide-modified polyvinylalcohol having an average degree of polymerization of 600 to 1700 and containing 1–30 mol% of acrylamide.

4,416,472

HOLDDOWN AND PACKOFF APPARATUS

John H. Fowler, and David L. Gruller, both of Houston, Tex., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Dec. 22, 1980, Ser. No. 219,323
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—3 **20 Claims**



1. A well apparatus for preventing axial movement of a hanger disposed within a head, the head having a bore therethrough and there being an annulus between the hanger and head, and for sealing the annulus between the hanger and head, the hanger having a shoulder thereon and the head having a seat in the bore, the shoulder being supported by the seat, and the head having a holddown groove in the wall of the bore spaced above the seat, comprising:

an expandable ring disposed on a surface of the shoulder on the hanger adjacent the holddown groove in the bore of the head for expanding into holddown engagement with the holddown groove, said ring having a tapered surface;

a locking ring having first connection means connected to the hanger and a tapered surface shaped for camming engagement with said tapered surface of said expandable ring for camming said expandable ring radially outwardly into holddown engagement with the holddown groove when said first connection means is made up;

releasable actuation means for actuating said locking ring into camming engagement with said expandable ring whereby said expandable ring engages the holddown groove to prevent axial movement of the hanger within the head, said actuation means including a body having second connection means connected to the hanger;

a member disposed on said body and engaging said locking ring for transmitting force from said body to said locking ring for making up said first connection means;

cooperable means on said body, member and hanger for disconnecting said second connection means and effecting release of said actuation means as said first connection means is made up, said cooperable means including said first and second connection means being oppositely-handed threaded connections and an axial lost motion connection between said body and said member;

first sealing means disposed in the annulus between the hanger and head above said expandable ring for sealing engagement with the hanger;

second sealing means independent of said first sealing means disposed in the annulus between the hanger and head for sealing engagement with the bore of the head; and

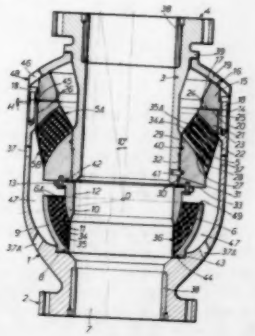
compression means having third connection means for connecting to the hanger upon disconnection of said second connection means for compressing said first and second sealing means in series.

4,416,473

FLEXIBLE JOINT FOR CONNECTION OF TWO PIPES

Jacques E. Lamy, Fontenay-aux-Roses; Dominique Michel, Paris, and Francisco D. M. Serrano, Issy-les-Moulineaux, all of France, assignors to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris", Paris, France

Filed Jun. 19, 1981, Ser. No. 275,394
Claims priority, application France, Jul. 11, 1980, 80 15454
Int. Cl.³ F16L *27/10*
U.S. Cl. 285—41 **8 Claims**



1. A flexible joint for connecting together a first pipe with a second pipe, comprising:

a cup-shaped piece having an upper annular edge forming an

upper cylindrical opening and also having a lower flange forming a lower axial orifice for connection with the first pipe;

a tubular piece for connection with the second pipe, said tubular piece being coaxial with the cup-shaped piece and being arranged partly therein;

a first and a second flexible spherical ring, each including a stack of alternating layers of spherical metal rings and elastomers, arranged between the cup-shaped piece and the tubular piece on opposite sides of a center of oscillation, said first and second flexible spherical rings having their concave surfaces directed concentrically towards the center of oscillation;

first mounting means for connecting the first and second flexible spherical rings to the cup-shaped piece;

second mounting means, positioned between the first and second flexible spherical rings, for interconnecting said first and second flexible spherical rings together;

means for connecting the tubular piece to the second mounting means;

an upper flange being attached to the upper annular edge forming the upper cylindrical opening of the cup-shaped piece and having a spherical upper surface; and

a spherical collar being supported by the tubular piece and having a spherical inner concave surface for riding in a complementary cooperating manner on the spherical upper surface of the upper flange above the upper annular edge forming the upper cylindrical opening of the cup-shaped piece;

whereby the tubular piece is able to oscillate at an angle of about $\pm 10°$ with respect to its vertical axis.

4,416,474

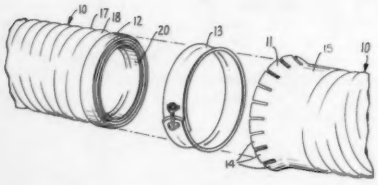
PIPE COUPLING

Robert F. Miller, 3368 Las Huertas Rd., Lafayette, Calif. 94549, and Paul K. Davis, 1121 Bay St., Alameda, Calif. 94501

Filed Jan. 12, 1981, Ser. No. 224,080

Int. Cl.³ F16L *59/16*

U.S. Cl. 285—47 **10 Claims**



1. A section of currugated pipe having complementary bell and spigot end portions, and more particularly comprising:

a bell end portion longitudinally segmented to form a plurality of integrally formed flexible side wall strips connected to and projecting from a substantially cylindrical shroud, each of said side wall strips terminating in a curved end; and

a spigot end portion receivable within said bell end portion, the exterior surface thereof defining a pair of axially spaced annular recesses and terminating in a cylindrical extension, one recess being located for radial engagement by the side wall strips of another section when connected therewith, the other recess being located axially between said one recess and said cylindrical extension for receiving a resilient O ring seal that contacts with the interior surface of the shroud of a bell end portion of another pipe section.

4,416,475

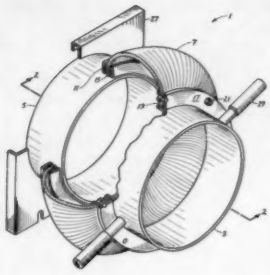
FLEXIBLE COUPLING

Ralph C. Stacey, Greenfield Center, N.Y., assignor to Tarrant Manufacturing Company, Saratoga Springs, N.Y.

Filed Dec. 9, 1982, Ser. No. 448,242

Int. Cl.³ F16L *27/10, 55/00, 27/00;* **A47L** *9/24*

U.S. Cl. 285—229 **8 Claims**



1. A flexible coupling for flow of effluent therethrough, said flexible coupling comprising two collars and an annular flexible member, each of said collars having a longitudinal axis, one of said collars having means carrying said annular flexible member in fixed relationship therewith and the other of said collars having means freely mounting in retentive and sealing relationship said annular flexible member to allow 360° relative rotation or swivel of said collars and, with respect to said longitudinal axes of said collars, to allow relative alignment, misalignment and offset disposition, and relative disposition of said longitudinal axes of said collars at different angles to each other, and said flexible coupling having self-cleaning means to prevent such effluent from causing said flexible couping to clog up and malfunction.

4,416,476

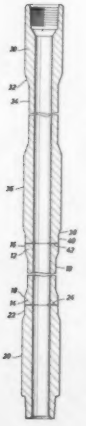
INTERMEDIATE WEIGHT DRILL STEM MEMBER

William R. Garrett, Conroe, Tex., assignor to Oncor Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 188,027, Sep. 17, 1980, abandoned. This application Nov. 21, 1980, Ser. No. 208,987

Int. Cl.³ F16L *15/00*

U.S. Cl. 285—286 **14 Claims**



1. A drill stem member, comprising

a tubular body being sufficiently rigid for operating under compression while adding weight to the drill stem near the drill bit and being sufficiently flexible for negotiating commonly encountered borehole dog-legs, said body having a wall thickness of at least 0.620 inches, said body having upper and lower upset ends,

a bottom tool joint having a threaded connection lower end for connection to an adjoining drill stem member, and an upper end with a wall dimension equal to said lower upset of said body,

a first weld joining said body lower upset end and said upper end of said bottom tool joint,

a top tool joint having

a threaded connection upper end for connection to an adjoining drill stem member,

a lower end with a wall dimension equal to said top upset end of said body, and

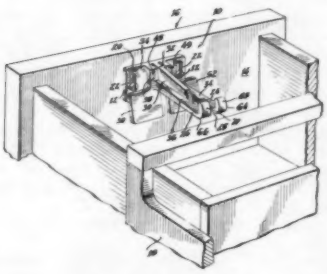
a reduced external diameter intermediate length between its threaded upper end and its lower end to provide a lifting surface above said intermediate length, and

a second weld joining said body upset end and said lower end of said top tool joint.

4,416,477
CHILD-PROOF LATCH

Walter Bialobrzeski, 68 Summerwood Dr., Wallingford, Conn. 06492, and Paul A. Sperry, 376 State St., North Haven, Conn. 06473

Filed Nov. 2, 1981, Ser. No. 317,010
Int. Cl.³ E05C *19/06*
U.S. Cl. 292—19 **6 Claims**



1. A child-proof latch for attachment to a closure panel of a drawer, cabinet or the like, the closure panel being moveable with respect to a frame or the like, the latch comprising:

a support base for mounting on said closure panel;

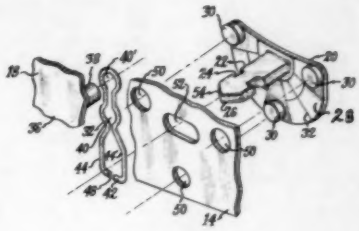
a pair of elongate restraining arms projecting outwardly with respect to said base in generally parallel relation to each other and being separated along their length by a space, each said restraining arm having an end portion including means for abutting said frame, said restraining arms being biased toward said frame to provide for engagement of said frame by both said abutting said panel with respect to said frame to a predetermined distance, each said restraining arm being movable independently of the other restraining arm against said bias away from said frame to disengage said abutting means to permit further opening of said panel only upon simultaneous movement of both restraining arms; and

a wall projecting from said base in said space between said restraining arms, said wall having a length sufficient to span the said predetermined distance between said panel and said frame, said wall including an upper surface located above said restraining arms, said wall for preventing single finger simultaneous movement of both said restraining arms by imposition of a downward force on said restraining arms.

4,416,478
TAMPER DETERENT SEAL PROVIDING INDICATION OF TAMPERING FOR WATTHOUR METERS

Robert S. Canney, Berwick, Me., assignor to General Electric Co., Somersworth, N.H.

Filed Nov. 10, 1980, Ser. No. 205,466
Int. Cl.³ B65D *33/34*
U.S. Cl. 292—307 R **9 Claims**



1. The combination comprising:

(a) a seal constructed of a frangible material forming a replaceable element, said seal including a stem having a notch formed in one end thereof and having, at its other end, a head capable of being readily fragmented when placed under stress;

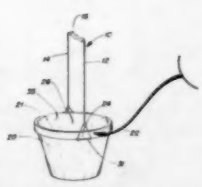
(b) a kilowatt hour meter including a clip configured to receive the stem of said seal and engage the notch in the one end of the stem of said seal; and

(c) a meter box for mounting said kilowatt hour meter, said meter box having a removable cover configured to press against a portion of said kilowatt hour meter when said cover is installed on said meter box to retain said kilowatt hour meter in said meter box, said cover having an opening formed in a portion thereof which is in alignment with said clip on said kilowatt hour meter, whereby, when the stem of said seal is inserted through the opening the notch on the stem of said seal lockingly engages said clip, to secure said cover to said meter box and provide a seal which, when placed under stress, fragmentizes to provide a visual indication of at least attempted unauthorized tampering to gain access to the inside of said meter box.

4,416,479
ATTACHABLE CARRIER HANDLE AND PICK-UP APPARATUS

Camille J. Rocquin, 1410 Demosthenes St., Metairie, La. 70005

Filed Aug. 26, 1982, Ser. No. 411,915
Int. Cl.³ A01K *29/00*
U.S. Cl. 294—1 B **2 Claims**



1. A disposable pick-up apparatus having removable handle means, comprising:

a. a container portion having a continuous side wall, and a bottom portion integrally attached to said side wall, to-

gether defining a container space therein; said side wall further comprising an upper annular shoulder portion therearound;

b. removable handle means, comprising:

i. a substantially horizontally disposed handle portion having cushion means therearound for grasping; and

ii. first and second downwardly depending extender portions connectable on their upper ends to said horizontal handle portion, and on their lower ends, each of said extender portions further comprising inner and outer flexing members, having triangulated brackets wherein the base of said triangulated bracket engages the bottom edge of said shoulder portion of said container, and said inner flexing member engages the inner wall of said container for maintaining said shoulder portion at rigid engagement therebetween; wherein upon outward flexing, said flexing members disengage said shoulder portion of said container; and

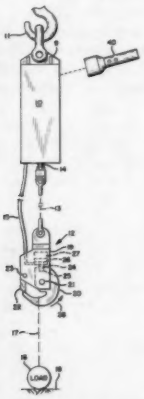
c. pick-up means, for retrieving items to be picked up, said means further comprising at least a first moisture-proof surface, and a second adhering textured surface for making contact with the item to be picked up.

4,416,480

PNEUMATIC RELEASE FOR LOAD HOOK

Jack M. Moody, Milwaukie, Oreg., assignor to Cranston Machinery Co., Inc., Oak Grove, Oreg.

Filed Sep. 8, 1981, Ser. No. 299,810
Int. Cl.³ B66C *1/38*
U.S. Cl. 294—83 R **6 Claims**



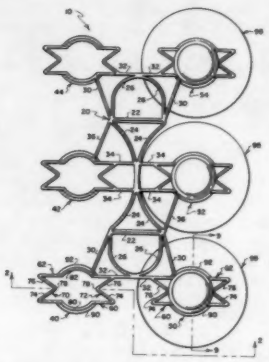
1. A pneumatic release device for a load hook which is releasable by pneumatic pressure, comprising a compressed air reservoir connected through a valve to said load hook to release a load from said hook, an air pump cylinder and piston operable by the application of said load to the hook to move said piston in an air pumping stroke to pump air into said reservoir, and means for reversing said piston stroke when load tension is removed from said hook, said device comprising a self contained power and control module containing said air pump cylinder and piston, air reservoir and valve, said load hook being connected to a piston rod in said piston, and an air pressure line extending from said module to said load hook.

4,416,481

BOTTLE CARRIER

Myron E. Ullman, Canfield, Ohio, assignor to Kessler Products Co., Inc., Youngstown, Ohio

Filed Apr. 1, 1981, Ser. No. 250,085
Int. Cl.³ B65D *71/00*
U.S. Cl. 294—87.2 **14 Claims**



1. A one-piece bottle carrier made of relatively rigid plastics material and comprising:

(a) a plurality of bottle-neck-receiving formations each including an endless band defining a neck-receiving opening;

(b) each band having at least one W-shaped portion formed from two elongate inner leg portions each having first and second opposed end regions, the inner leg portions being interconnected at their first end regions and forming a "V" shaped projection which projects in a direction toward the center of its associated neck-receiving opening, and two outer leg portions each of which is connected to a separate one of the inner leg portions at the second end regions thereof, the configuration of each of the W-shaped portions serving to permit parts of its associated band to move relatively toward and away from each other

(i) to enable cap-carrying portions of a bottle neck to be inserted through the opening; and,

(ii) to grip bottle neck portions inserted through the opening;

(c) framework means for interconnecting the spaced neck-receiving formations to support the neck-receiving formations in a predetermined array; and,

(d) the V-shaped projections being configured to engage neck portions of bottles inserted through associated ones of the neck-receiving openings, and to cooperate with other parts of the endless bands to securely releasably grip such bottle neck portions.

4,416,482

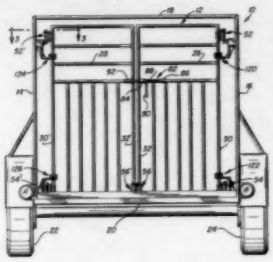
VEHICLE GATE ASSEMBLY

Charles C. Patterson, Waco, Tex., assignor to Willie Mae Patterson, Waco, Tex.

Filed Jan. 2, 1981, Ser. No. 222,247
Int. Cl.³ B60P *3/00*
U.S. Cl. 296—3 **16 Claims**

1. A gate assembly used with a vehicle which has a cargo area defined by at least two sides extending substantially parallel to one another, comprising: a gate member connected to the vehicle within the cargo area and moveably disposed between an opened position to allow access into the cargo area and a closed position to limit access into the cargo area, said gate member having a body with first and second sides; guiding means connected to the vehicle for restricting movement of the first side of said gate member to a direction line substan-

tially parallel to the parallel sides of the vehicle and for restricting movement of the second side of said gate member to a direction line substantially perpendicular to the parallel sides of the vehicle when said gate member is being moved between



the opened and closed positions; and locking means adapted to maintain the first and second sides of said gate member in a fixed transverse relation to the parallel sides of the vehicle when said gate member is in the closed position.

4,416,483

ARRANGEMENT FOR STORING TOOLS AND INSTRUMENTS IN POWER VEHICLES

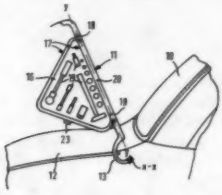
Adolf Koch, Waiblingen-Neustadt, Fed. Rep. of Germany, assignor to Autohaus Lorinser G.m.b.H., & Co., Waiblingen, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,665

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1981, 3101161

Int. Cl.³ B60R *11/06*

U.S. Cl. 296—37.1 **27 Claims**



1. An arrangement for storing objects, particularly tools and instruments, in a trunk of a power vehicle, the trunk having a trunk cover turnable about a turning axis for opening and closing thereof, said arrangement comprising a wall element arranged at an inner surface of the trunk cover and pivotable about a pivot axis relative to the trunk cover between a closed position in which it forms a closed compartment and an open position in which the compartment is opened, wherein the pivot axis is inclined relative to the turning axis of said trunk cover so that in the open position said wall element is inclined toward a side of the vehicle and thereby facilitates access to the tools and instruments; and means for pivotally mounting said wall element at one side of said inner surface of said trunk cover.

4,416,484

FLAT BED SIDE ASSEMBLY

David O'Neill, Billings, Mont., assignor to Richard P. O'Neill, Miles City, Mont., a part interest

Filed Mar. 18, 1982, Ser. No. 359,264

Int. Cl.³ B60P *1/64*

U.S. Cl. 296—43 **11 Claims**

1. A removable side assembly for a flat bed of a truck or traileer, said side assembly including a barrier portion, a socket portion, a support portion and a holder portion; said barrier portion including a plurality of generally rectangular panels, said panels being disposed generally vertically in an end to end relationship around the periphery of said flat bed; said socket portion including a plurality of pocket sections, said pocket sections being arranged around the periphery of said flat bed adjacent the lower edges of said panels, each of said pocket sections extending downwardly from a plane through said flat bed; said support portion including a plurality of elongated bar members having cross-aectional configurations substantially the same as those of said pocket sections, each bar member having its lower end disposed within one of said pocket sections, said bar members extending upwardly from said pocket sections genrally vertically; said holder portion including a plurality of bracket members with at least one bracket member engaging each of said bar members, each bracket member including a plate section, a strip section having its ends affixed to said plate section and being bent into a configuration to

provide an opening having substantially the same cross-sectional configuration as that of said bar members for separable engagement therewith, a hook member extending from one end of said plate section, said hook member including a connector section extending substantially perpendicularly from a transverse edge of said plate section, said connector section extending from said plate section a distance substantially equal to the thickness of a barrier panel, a projecting section extending from an edge of said connector section remote from said plate section, said projecting section extending from said connector section in the same direction as said plate section and substantially parallel thereto; whereby said barrier panels are positioned against said bar members with the lower edges thereof resting on said flat bed and the upper edges of said barrier panels being retained between said plate section, said connector section and said projecting section of said holder portions to provide a continuous side assembly around the periphery of said flat bed.

4,416,485

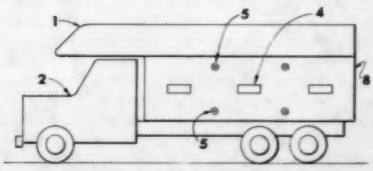
MULTIPLE USE: PONTOON BRIDGE SECTION

Alvin L. Long, Civilian Gen. Del., Beale A.F.B., Calif. 95903

Filed Sep. 2, 1981, Ser. No. 298,902

Int. Cl.³ B62D *25/00, 29/00, 33/00*

U.S. Cl. 296—188 **3 Claims**



1. A protective cover for a military vehicle, said vehicle having a cargo box with at least four apertures for receiving cargo support structure, said protective cover comprising:

a support structure of metal framework, said support structure having two longitudinally extending sides, two later-

ally extending sides, and at least four depending legs, said legs being received in said cargo box apertures;

a recess in each of said longitudinally extending sides of said support structure;

at least two bullet resisting pontoon decking panels, said panels being fixed to said longitudinally extending sides of said support structure and to said vehicle cargo box, said panels having gun ports formed therein and a tongue formed thereon, said tongue extending upwardly and adjacent said recess when said panels are fixed to said longitudinally extending sides, and said cargo box;

a pontoon bridge section, said pontoon bridge section having a pair of gunwales, each said gunwale having a groove formed therein, said pontoon bridge section being placed upon said support structure such that each gunwale is received in one of said recesses and such that each panel tongue is received in one of said grooves.

4,416,486

VEHICLE CAB

James B. McNaught, St. Germaine-en Laye, and Guy E. P. Colotte, Bretigny, both of France, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

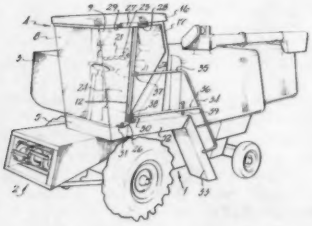
PCT No. PCT/EP80/00076, § 371 Date May 1, 1981, § 102(e) Date Apr. 3, 1981, PCT Pub. No. WO81/00541, PCT Pub. Date Mar. 5, 1981

PCT Filed Aug. 9, 1980, Ser. No. 253,744

Claims priority, application United Kingdom, Aug. 31, 1979, 7930255

Int. Cl.³ B62D *33/06*

U.S. Cl. 296—190 **9 Claims**



1. A cab for an agricultural, industrial or construction vehicle having a front wall, rear wall, side walls and a driver access door; hinge assemblies connected between a forward upright edge of the door and an adjacent side wall so that the door swings about an upright hinge axis (X-X) between a closed and fully open position; an entry platform that is provided alongside the doorway; steps provided at the rear of the platform for access from the ground; and stop means that prevents the door opening beyond the outer edge of the platform and thereby defines the fully open position of the door; the cab being adapted so that in the closed position the door is angled from said adjacent side wall (9) towards the rear wall (20, 22) with its outer surface facing both sidewards and rearwards, and in the fully open position defined by said stop means (34) is angled from said adjacent side wall (9) sidewards and rearwards over the full width of the platform (32) with its inner surface facing rearwards; and said hinge axis (X—X) being orientated relative to the plane of the door (17) so that the upper edge of the door (17) moves outwards further than the lower edge of the door (17) as the door is opened and the door is thereby inclined outwards from bottom to top in the fully open position.

4,416,487

SLIDING ROOF STRUCTURE FOR AUTOMOBILE BODIES

Yasunari Hirotani, and Yoshimitsu Tanaka, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Aug. 13, 1981, Ser. No. 292,720

Claims priority, application Japan, Aug. 15, 1980, 55-112817

Int. Cl.³ B60J *7/10*

U.S. Cl. 296—222 **8 Claims**

1. A sliding roof structure for an automobile body including a roof panel formed with a roof opening defined by a downwardly bent peripheral flange, a roof side rail formed at each side of the roof panel, a reinforcement member of an inverted channel shape having a downwardly extending inboard flange, a substantially horizontal top wall, and a downwardly extending outboard flange having a lower end contiguous with an outwardly extending horizontal flange, said reinforcement member being attached at said inboard flange with said peripheral flange of the roof panel, a sliding roof carrying frame for movably carrying a sliding roof and having an opening corresponding to the opening of the roof panel and disposed beneath the roof panel, bracket means secured to said roof side rail, means for connecting said sliding roof carrying frame to said bracket means, downwardly projecting locating means provided on said reinforcement member at the horizontal flange for cooperating with said sliding roof carrying frame for locating the latter.

4,416,488

ARM REST FOR A VEHICLE SEAT

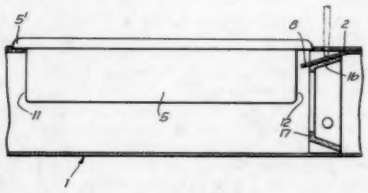
Helmut Wall, Kirchheim-Teck, Fed. Rep. of Germany, assignor to Keiper Recaro GmbH, Fed. Rep. of Germany

Filed Mar. 17, 1981, Ser. No. 244,675

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 8009110[U]

Int. Cl.³ A47C *7/54*

U.S. Cl. 297—411 **4 Claims**



1. Arm rest for a vehicle seat, such as an airplane passenger seat or a bus seat, comprising:

a hollow support including an opening in one side wall;

a control device which is constructed to be received within said opening of said side wall of said support;

said control device having extended portions disposed on opposite sides thereof which engage the narrow edges of said opening and extend beyond said opening;

a flexible tongue connected to said side wall, the free end of said tongue extending toward one side of said control device to prevent lateral shifting of said control device

when in a locking position, said tongue being deflected out of said locking position into a release position where shifting of said control device toward said tongue is allowed;

a stop means for limiting the degree to which said tongue can be deflected into the interior of said support;

a stiffening body arranged within said support, said stop means being formed by a surface of said stiffening body;

said surface being canted to correspond to the maximum deflection position of said tongue;

whereby said extended portion of said control device opposite said tongue can be disengaged from the edge of said opening.

4,416,489

CHISEL FOR A CRUST BREAKING FACILITY

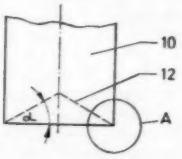
Thomas Haggenmacher, Gampel; Edwin Gut, Steg; Hans Friedli, Steg, and Gottfried Maugweiler, Steg, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 184,480, Sep. 5, 1980, abandoned. This application Sep. 23, 1982, Ser. No. 421,895

Claims priority, application Switzerland, Sep. 10, 1979, 8150/79

Int. Cl.³ C25C *3/14*

U.S. Cl. 299—94 **12 Claims**



1. Breaking device for a crust breaking facility for breaking the solidified crust of solid electrolyte on an electrolytic cell for the production of aluminum which comprises a chisel having a bottom face and edge regions thereof, wherein at least parts of the edge regions of the chisel project beyond the other regions of said chisel and are shaped as cutting edges to form a recess in said bottom face, including inclined portions extending inwardly from said edge portions such that the bottom face of the chisel does not feature any areas which are inclined outwards which would create outwardly acting forces concurrent with pushing the chisel through the crust, thereby the force required for breaking through the crust is considerably reduced, the lateral forces are directed inwardly and a circular hole in the crust is developed.

4,416,490

PRESSURE CONTROL VALVE FOR A HYDRAULIC BRAKE SYSTEM

Hans D. Reinartz, Frankfurt am Main, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

60606

Filed Nov. 3, 1981, Ser. No. 317,718

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1980, 3046781

Int. Cl.³ B60T *8/26, 11/34*

U.S. Cl. 303—6 C **15 Claims**

1. A pressure control valve for a hydraulic brake system comprising:

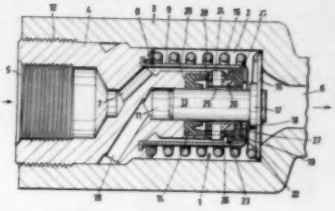
a control piston having one end thereof guided through an annular seal and in a bore of said housing connected to atmosphere; said annular seal being in abutment with a step in said housing;

a closure member carried by said piston adjacent the other end thereof;

a support plate for engagement with a valve spring carried by said piston between said closure member and said other end of said piston;

an annular body encircling said piston disposed adjacent said annular seal, said annular body providing a valve seat adjacent said closure member;

a tubular body surrounding said annular body and fastened to said housing;



a return channel disposed between said annular body and said tubular body having a check valve therein opening in the direction from an outlet chamber to an inlet chamber; and

radial channels provided in a selected one of said annular body and a first clearance between said annular body and said annular seal.

4,416,491

PRESSURE CONTROLLING ARRANGEMENT FOR USE IN A VEHICLE BRAKE SYSTEM

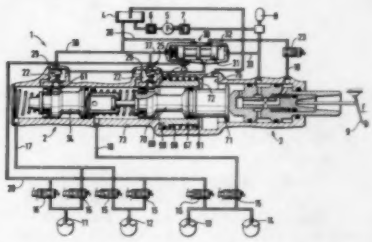
Juan Belart, Walldorf; Jochen Burgdorf, Offenbach; Dieter Kircher, Frankfurt am Main; Hans-Wilhelm Bleckmann, Obermoerlen, and Lutz Weise, Mainz, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 28, 1981, Ser. No. 316,153

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040562

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—113 **10 Claims**



1. An arrangement for controlling the effective pressure of a hydraulic braking fluid in a vehicle braking system provided with an auxiliary source of pressurized hydraulic fluid and antiskid control equipment, in dependence on the position of a brake pedal, comprising a master cylinder device including a housing defining a bore having a first section of a smaller diameter and an aligned adjacent second section of a larger diameter, and at least one master piston received in said first section of said bore for movement in opposite directions and operatively connected to the brake pedal for movement therewith at least in one of such directions, said master piston delimiting a working compartment in said first section of said bore frontwardly thereof as considered in the other direction and having an extension received with a spacing in said second section of said bore; at least one positioning piston surrounding said extension for sealed sliding relative thereto and to said

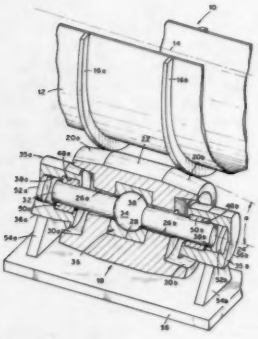
housing in said second section of said bore; entraining means on said extension and on said positioning piston for engaging one another in an engaging position of said positioning piston relative to said extension; and means for admitting the pressurized fluid from the auxiliary source into said working compartment and into said second section of said bore frontwardly of said positioning piston during antiskid control action of the antiskid control equipment to replenish the supply of pressurized fluid in said working compartment and to urge said positioning piston into a predetermined position relative to said housing in which said entraining means is engaged and said master piston assumes a defined position within said bore.

4,416,492

SYSTEM FOR AUTOMATICALLY ALIGNING A SUPPORT ROLLER SYSTEM UNDER A ROTATING BODY

B. Huston Singletary, Oak Ridge, Tenn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jul. 21, 1982, Ser. No. 400,544
Int. Cl.³ F16C *13/06, 23/04*
U.S. Cl. 308—203 **4 Claims**



1. A system for supporting a body for rotation about a central axis extending therethrough, comprising:

a pair of support rings mounted on said body and projecting outward therefrom and extending around its periphery in spaced apart relation axially of said central axis;

a support roller having at opposite ends thereof tapered peripheral surfaces which respectively engage the outermost surfaces of said support rings and which decrease in diameter toward the ends of the roller, an aperture extending between the end surfaces of said roller and having a ball-type swivel surface formed at the middle portion thereof, a shaft disposed within the aperture in said roller with its ends projecting outward therefrom, the middle portion of said shaft being formed with a ball-type swivel surface conformably engaging the swivel surface on said roller to thereby permit universal pivotal movement of the roller relative to the shaft; and

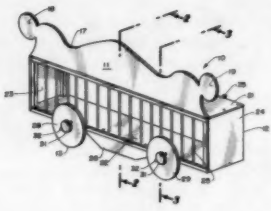
a pair of fixedly positioned support elements each comprising: (1) a housing (2) an annular bearing fixed in said housing and slidably fitted around a respective end of said shaft so that the shaft is reciprocatable along the central axis of the bearing, and (3) means for limiting movement of said shaft along the central axis of said bearing.

4,416,493

WALL MOUNTED DISPLAY CASE FOR STUFFED ANIMALS

Gary D. Sumner, 6804 Bix Ave., Citrus Heights, Calif. 95610

Filed Apr. 27, 1981, Ser. No. 257,701
Int. Cl.³ A01K *1/00*
U.S. Cl. 312—245 **8 Claims**



1. A wall mountable, three dimensional display case for displaying a plurality of stuffed animals or the like in an environment aesthetically pleasing to the eye comprising:

an elongated top planar section spaced from and secured to an elongated bottom planar section by side panels afixed to both of same, said sections and panels forming a box open along the front thereof and the rear thereof,

a plurality of spaced elongated vertical members removably secured along the open front of said box simulating the spaced bars of a cage, wherein said members are dowels inserted into aligned holes in the top and bottom planar sections, the holes in the top planar section extending all the way through said top planar section, the holes in the bottom planar section extending only part way therethrough whereby dowels can be removed upwardly from said top and bottom planar sections,

a pair of spaced circular planar sections mounted along the front lower portion of said box simulating wheels, and

a vertical planar section mounted along the length of said top planar section, normal thereto, whereby after wall mounting, removal of selected ones of said dowels permits access to the interior of said box whereby stuffed animals may be inserted therein with subsequent replacement of said selected ones of said dowels thereby simulating the caging of animals inside of said cage.

4,416,494

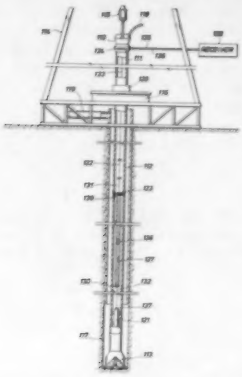
APPARATUS FOR MAINTAINING A COILED ELECTRIC CONDUCTOR IN A DRILL STRING

Larry A. Watkins, and Leon H. Robinson, Jr., both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Oct. 6, 1980, Ser. No. 194,098
Int. Cl.³ H01R *4/64*
U.S. Cl. 339—15 **37 Claims**

26. A drilling apparatus having a sectionalized tubular drill string, a rotary drill bit connected thereto, and means for adding additional pipe sections to said drill string, an insulated electric conductor disposed within said drill string and having a lower end at a subsurface location, an upper end proximate the upper end of said drill string, an intermediate portion arranged as a spring coil within a flexible coiled wire storage means, which means is supported in the drill string, and a connector at said upper end, said connector being adapted to permit the addition of pipe sections to the upper end of said

drill string upon elevating said upper end of said conductor relative to said drill string and thereby permitting said conductor to be extended through additional pipe sections added to said drill string.

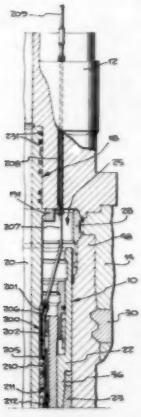


4,416,495

CONCENTRIC ELECTRIC CONNECTOR FOR SUBSEA WELL APPARATUS

Albert M. Regan, Huntington Beach, Calif., assignor to Hughes Tool Company, Houston, Tex.

Filed Jun. 5, 1981, Ser. No. 270,736
Int. Cl.³ H01R *13/523*
U.S. Cl. 339—16 C **4 Claims**



1. In a subsea well apparatus having a tubing mandrel associated with a christmas tree of the well and being removably landed in a tubing hanger associated with the wellhead, the improvement comprising:

a socket having an interior cylindrical wall carried in the tubing hanger and an electrical contact member located in the inner wall and exposed to the interior of the socket;

the mandrel carrying an exterior wall dimensioned for sliding, telescoping reception within the socket and an electrical contact member located in the exterior wall and exposed to the exterior of the mandrel, the mandrel electrical contact member being positioned for engaging the socket contact member when the mandrel is landed; and

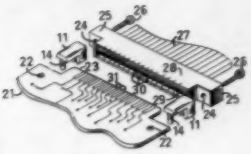
upper and lower annular seal means located in one of the walls above and below the contact members for purging environmental liquid from the contact members as the mandrel lands in the socket and for sealing the contact members from environmental liquid when engaged.

4,416,496

EDGE ANCHORS FOR PRINTED CIRCUIT BOARD CONNECTORS

Paul E. Brefka, 196 Cordaville Rd., Southborough, Mass. 01772

Filed Mar. 6, 1981, Ser. No. 241,023
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—17 C **9 Claims**



1. An anchor, injection-molded in one piece, for use with an electrical connector mounted on edge contacts protruding from a printed circuit board (p.c.b.), wherein mounting holes on the connector are directly aligned with the centerline of the plane of the p.c.b. and the anchor comprises:

(a) a receiving block abutting the edge of the p.c.b.;

(b) an extension to that block over the surface of the p.c.b.;

(c) a connecting means, acting between the extension and the p.c.b. perpendicular to the p.c.b.;

(d) a horizontal, cylindrical bore aligned with the centerline of the plane of the p.c.b. and extending between an outer receiving face and an inner board-contacting face of the receiving block, designed to receive a screw which will secure the connector to the device;

(e) a vertical slot running along the length of the underside of the receiving block from the inner face to the outer face and extending upwardly to the horizontal bore as an injection mold release,

the sum of which provides both a self-securing means to anchor the device to the p.c.b., without the need for additional attachment means, and a firm securing means to anchor the connector to the device, which, when simply slipped perpendicularly onto the p.c.b. and the connector slipped onto the protruding edge of the p.c.b. and screwed into the anchor, prevents horizontal movement and disconnection.

4,416,497

SPRING CLIP ELECTRICAL CONNECTOR FOR STRIP CONDUCTOR CABLE

Gordon T. Brandsness, White Bear Lake; Robert L. Ebright, Bloomington, and Alexander J. Orosz, Roseville, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 27, 1981, Ser. No. 286,746
Int. Cl.³ H05K *7/12*
U.S. Cl. 339—17 F **9 Claims**

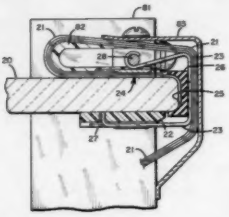
1. An electrical connector apparatus for electrically connecting a multiplicity of printed lands upon, and normal to the edge of, a planar substrate to a like multiplicity of stripped conductor ends within a flexible flat cable, which apparatus comprises:

spring clip means generally U-channel shaped with spring force exerting side planes of the U-channel for exerting squeezing compressive high spring first force normal to, and between, the side planes of the U-channel;

elastomeric pad means affixed to the U-channel interior at a base plane of the U-channel of said generally U-channel shaped spring clip means for exerting an elastomeric ex-

pansive second force normal to, and into the U-channel from, said base plane of the U-channel;

retention means for affixing both said planar substrate with a multiplicity of printed circuit lands normal to the edge of said substrate, plus said flexible flat cable with said like multiplicity of stripped conductor ends which is bendably disposed, meaning draped, over the edge of said planar substrate, within said U-channel shaped spring clip means so that both said planar substrate and said flexible flat cable draped thereon are directly compressively squeezed by said compressive high spring first force normal to the side planes of the U-channel of said generally U-channel shaped spring clip means, and so that both said planar substrate and said flexible flat cable draped thereon are



forcefully and compressively subject to said elastomeric expansive second force, resultant from said elastomeric pad means, normal to the U-channel base plane of the U-channel of said generally U-channel shaped spring clip means;

whereby with said flexible flat cable bendably disposed between said spring clip means and said planar substrate, said squeezing compressive high spring first force serves to compressively electrically contact said multiplicity of stripped conductor ends of said flexible flat cable against said multiplicity of printed circuit lands upon said planar substrate, while said elastomeric expansive second force serves to retain said flexible flat cable between said spring clip means and said planar substrate.

4,416,498

SOCKET-TYPE CONNECTORS FOR ELECTRIC CONNECTORS

Ryoichi Sado, Saitama, and Kazutoki Tahara, Ageo, both of Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 131,687, Mar. 18, 1980, abandoned. This application Dec. 10, 1981, Ser. No. 329,325

Claims priority, application Japan, Mar. 20, 1979, 54-3801

Int. Cl.³ H01R *13/52*

U.S. Cl. 339—60 R **2 Claims**

1. A socket-type connector in which the electrical connection is secured by inserting an electroconductive plate-like plug thereinto comprising:

(a) a base plate formed of an electrically insulating rigid material;

(b) a socket body formed of an electrically insulating and elastically resilient material covering said base plate forming a flat pocket with the base plate;

(c) at least one plate-like contacting element formed of a conductive material located inside said pocket formed by said base plate and said socket body, said contacting element being bonded to at least one of said base plate and said socket body and being urged into close contact by said resilient socket with the other of said socket body and said base plate so as to leave no void space within the pocket; and

(d) said socket body being bonded to said base plate on opposite sides of said contacting element along the direction of insertion of said plug, said socket body being elastically deformable to expand said pocket to form a void space for receiving said plate-like plug inserted thereinto, said plug being subjected to compressive force and urged against said contacting element due to the resilient deformation of said socket body.

4,416,499

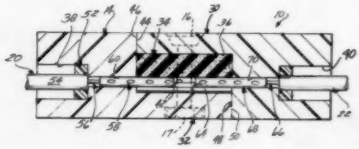
ELECTRICAL CONNECTOR ASSEMBLY

John F. Frascatore, Unadilla; Dean R. Nelson, Sidney, both of N.Y., and Edward K. Marsh, Orlando, Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Oct. 22, 1981, Ser. No. 313,566

Int. Cl.³ H01R *13/22*

U.S. Cl. 339—92 M **7 Claims**



1. An electrical connector assembly for establishing an electrical connection between a plurality of electrical leads comprising:

a cover;

a base;

each of said cover and base being configured with portions adapted to be interfit together upon assembly of said cover and base;

means for releasably retaining said cover and base together;

each of said interfit portions having opposing surfaces formed thereon;

said base bearing a plurality electrically conductive, parallel groove contacts, extending thereacross; each of said groove contacts electrically connected to a respective one of some of said leads, each of said plurality of groove contacts consisting of an elongated generally Vee shaped element;

a plurality of pin shaped contacts carried by said cover each configured and located to be advanced laterally onto a respective one of said groove contacts by interfitting of said cover and base portions, each of said pin shaped contacts adapted to be electrically connected to a respective one of the remainder of said leads, whereby an electrical connection therebetween may be established upon interfitting of said cover and base portions.

4,416,500

SCREWLESS ELECTRICAL TERMINAL

Paul Stenz, Detmold, Fed. Rep. of Germany, assignor to C. A. Weidmuller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Nov. 6, 1981, Ser. No. 318,904

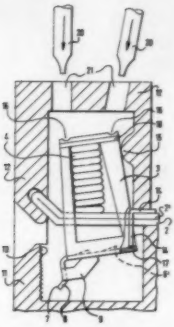
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1980, 3042057

Int. Cl.³ H01R *9/08*

U.S. Cl. 339—95 D **16 Claims**

1. A screwless electrical terminal comprising first and second clamping members for clamping between them an electrical conductor, said first member being a cage-like member movable bodily and tiltable relative to the said second member, clamping means resiliently biasing the first member to a conductor-clamping position, and a latching stop adapted to re-

leasably retain the first clamping member in an open position for reception of a conductor between the clamping members, said clamping members having a predetermined conductor-insertion direction, said first clamping member having a pivot element on that side of the first clamping member at which a conductor is inserted, and said terminal further including an



abutment facing the said pivot element for engagement thereby on movement of the first clamping member in the direction opposite the conductor-insertion direction, the abutment and pivot element being so disposed that such movement of the first clamping member tends to pivot the first clamping member to increase the conductor-clamping force exerted by the first clamping member.

4,416,501

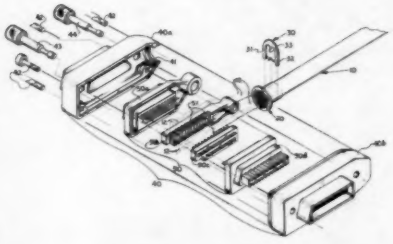
TERMINAL FOR ESTABLISHING ELECTRICAL CONTACT WITH A SHIELDED CABLE

David F. Fusselman, Elizabethtown, and Timothy A. Lemke, Carlisle, both of Pa., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Nov. 23, 1981, Ser. No. 324,132

Int. Cl.³ H01R *11/20*

U.S. Cl. 339—97 R **7 Claims**



1. In an electrical connector surrounded by a metallic shroud into which an insulated cable having a flexible conductive shield beneath an outer layer of insulation enters through an opening in such shroud for termination on said connector, a terminal for establishing an electrical connection between the shield and the shroud comprising a ferrule positioned on said cable beneath and supporting a portion of said flexible conductive shield, and a "U"-shaped insulation penetrating device penetrating the outer layer of insulation and capturing said ferrule and said shield and establishing contact with the flexible conductive shield with an inward compressive force while presenting an outwardly projecting portion, said opening in said shroud defining a spaced recess into which the outwardly projecting portion of the insulating penetrating device fits and makes contact with the shroud.

4,416,502

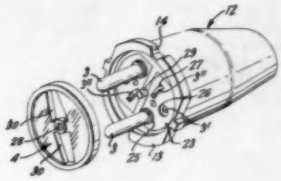
ELECTRICAL CONNECTOR

Clive Rumble, London, England, assignor to Corabelment A.G., Vaduz, Liechtenstein

Filed Jul. 29, 1981, Ser. No. 287,914

Int. Cl.³ H01R *13/58, 29/00*

U.S. Cl. 339—103 M **8 Claims**



1. An electrical connector comprising:

a body within which a plurality of extendable electrically conductive pins are housed, said body having a front end portion and a rearwardly extending portion;

a plurality of electrically conductive plates mounted at the front end portion of said body, each of said plates having apertures therein;

a plurality of pairs of electrically conductive pins slidably mounted in said body so as to be movable between a retracted position behind said plates and an extended functional position extending frontwardly through respective apertures of said plates, said pins having a rear portion, the rear portion of said pins being in electrical contact with a respective plate of said plurality of plates when said pins are in the extended functional position;

a rotatable masking means mounted in front of said plates, said masking means having opposed windows therein so as to allow the selective exposure and extension of a pair of said electrically conductive pins;

a plurality of electrical terminals at the rearwardly extending portion of said body;

a plurality of electrical connections extending through said body, each of said connections extending from a respective terminal of said plurality of terminals through said body to a respective plate of said plurality of plates; and

a casing receiving said body, said casing having a rearwardly extending socket capable of receiving an electrical cable.

4,416,503

GRIPPING OR LOCATING DEVICES

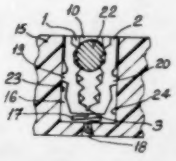
Derek Hayes, Bungay, England

Filed Jul. 13, 1981, Ser. No. 282,585

Claims priority, application United Kingdom, Jul. 14, 1980, 8022922

Int. Cl.³ H01R *13/40*

U.S. Cl. 339—220 R **10 Claims**



1. In a device for gripping or locating an elongated member, which device comprises the combination of a pair of jaws made at least partly of resilient plastics material, said pair of

jaws including resilient means joining respective first ends of the jaws, whereby respective second ends of the jaws are able to flex resiliently away from one another, each of said jaws further including an inwardly-facing surface and an outwardly-facing surface, the inwardly-facing surfaces of the two jaws confronting one another, and a camming means including a pair of spaced-apart inwardly-facing surfaces between which the pair of jaws is insertable, with said first ends of the jaws first, for the purpose of engaging said outwardly-facing surfaces of the pair of jaws with said inwardly-facing surfaces of said camming means so that the jaws are urged towards one another in order to grip or locate an elongated member disposed in said gap intermediate the first and second ends of the jaws and substantially parallel to said ends, the improvement wherein the confronting, inwardly-facing surfaces of the jaws define a gap which increases in width in the direction from the first ends of the jaws towards the second ends thereof, and said jaws and said camming means are shaped so that, when the pair of jaws is inserted into said camming means between said inwardly-facing surfaces thereof with no elongated member in said gap, there exists a gap between the outwardly-facing surface of one of the jaws and the adjacent inwardly-facing surface of the camming means in a region extending from the second end of said one jaw towards the first end thereof, whereby urging together of the jaws takes place by engagement of a limited area of the outwardly-facing surface of said one of the jaws and the adjacent inwardly-facing surface of the camming means.

4,416,504

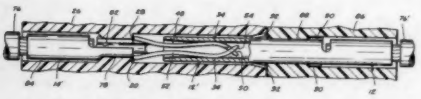
CONTACT WITH DUAL CANTILEVERED ARMS WITH NARROWED, COMPLIMENTARY TIP PORTIONS

Jerzy R. Sochor, 164 Rockview, Irvine, Calif. 92715

Continuation of Ser. No. 92,125, Nov. 7, 1979, abandoned. This application Mar. 8, 1982, Ser. No. 355,472

Int. Cl.³ H01R *13/05*

U.S. Cl. 339—252 P **5 Claims**



1. An electrical contact comprising:

a body portion,

a pair of freestanding elongated cantilevered contact arms extending from said body portion in a first and mating direction,

the end portion of each of said contact arms remote from said body portion having a convex mating surface facing away from the other contact arm in a second and flexing direction which is perpendicular to said first and mating direction,

each of said contact arms comprising a bent sheet metal member whose width, as measured in a third and lateral direction perpendicular to said first and second directions, is substantially greater than its thickness, as measured generally in said second and flexing direction,

each of said contact arms being flat when traversed in said third and lateral direction on either surface thereof at any location therealong,

said contact arms each having a tip portion, at the free end thereof, that is narrower, in said third and lateral direction, than the rest of said contact arm,

the tip portion of one arm being on the left side thereof and the tip portion of the other arm being on the right side thereof, when said contact arms are viewed in said second and flexing direction, so that said tip portions occupy complementary spaces in the width diemension of said contact when viewed in said second and flexing direction,

the tip portion of each contact having a substantially uniform width in said third and lateral direction,

said tip portions having a separation which, when viewed in said second and flexing direction, is substantially parallel to said first and mating direction,

said contact arms also curving toward and overlapping each other at the tip portions thereof, when viewed is said third and lateral direction.

4,416,505

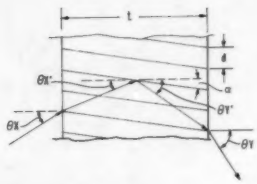
METHOD FOR MAKING HOLOGRAPHIC OPTICAL ELEMENTS WITH HIGH DIFFRACTION EFFICIENCIES

LeRoy D. Dickson, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,645

Int. Cl.³ G02B *27/17;* **G03H** *1/20*

U.S. Cl. 350—3.71 **4 Claims**



1. A method of making holographic optical elements with high diffraction efficiencies by optically replicating a previously recorded interference pattern from a master element onto a closely adjacent, unexposed copy element which is known to change in thickness as a result of post-exposure processing, said interference pattern consisting of parallel Bragg surfaces within the master element oriented at a desired angle relative to the master element surface, said method being characterized by the steps of:

illuminating the master element with a coherent replicating beam oriented to initially establish Bragg surfaces within the closely adjacent copy material at an intermediate angle relative to the copy material surface, said intermediate angle being different from the desired final angle of the Bragg surfaces in the copy; and

processing the copy material to fix the Bragg surfaces, said Bragg surfaces being tilted to the desired final angle as a result of process-induced changes in the thickness of the copy material.

4,416,506

APPARATUS FOR SPLICING FIBER OPTIC WAVEGUIDES

Tore R. Johnson, Harrisburg, and Keith Johnson, Jr., Manheim, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 22, 1981, Ser. No. 285,714

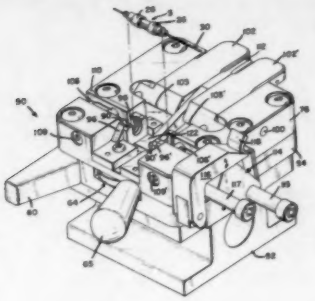
Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.21 **7 Claims**

1. Apparatus **50** for splicing a pair of optical waveguides **32**, **34** in a connector **5** of the type having an elongate tubular body **12** with a stepped external surface, three elongate cylindrical rods **2** therein defining an interstitial passageway **44** therebetween, and a pair of crimping collars **26** which are advanced to the center of the body **12** to radially compress the body **12** and effectuate the splice, said apparatus **50** comprising:

means for advancing said crimping collars **26** toward the center of said body **12**, said means comprising U-shaped

crimping cradles **92, 92'** which bear against said collars **26** from opposite directions,



holding means for holding said tubular body **12**, said holding means remaining stationary while said means for advancing advances said crimping collars.

4,416,507

METHOD FOR IN SITU SPLICING OPTICAL FIBER CABLES

Jean P. Hulin; Andre Bouvard, and Patrick Le Maitre, all of Conflans Sainte Honorine, France, assignors to Lignes Telegraphiques et Telephoniques, Conflans Saint Honorine, France

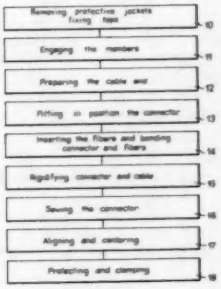
PCT No. PCT/FR81/00038, § 371 Date Apr. 30, 1981, § 102(e) Date Apr. 30, 1981, PCT Pub. No. WO81/02794, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 13, 1981, Ser. No. 261,178

Claims priority, application France, Mar. 14, 1980, 80 05737

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.22 **8 Claims**



1. A method for splicing two optical fiber transmission cables each provided with a dielectric support in which are housed optical fibers, said method comprising the following operating steps performed on each cable end:

(a) the cable ends are stripped over a predetermined length;

(b) the fibers thus freed are opened-out;

(c) the support which has been freed from its fibers is cut at right angles to its axis and a terminal connector provided with grooves is fixed on the end of the support;

(d) the fibers are turned down into the grooves of the terminal connector and are rigidly fixed therein, said turning down and fixing step including the following operations:

a hollow member provided with a longitudinal slot having a width in the vicinity of the diameter of a fiber is arranged coaxially to the terminal connector and the member is rotated in such a manner as to ensure that the slot is placed successively opposite to each groove so as to permit introduction of the fibers successively within each groove of the terminal connector after the fibers have been released from the cable support,

a first O-ring seal previously engaged on the cable end is slidably displaced along the terminal connector so as to apply the fibers to the bottom of the grooves of the terminal connector,

the fibers are bonded in position within the grooves of the terminal connector,

(e) the terminal connector as well as the fibers carried by this latter are cut at right angles to the axis of the connector;

(f) each support-connector assembly is fixed in position by rigidification means;

(g) the two cables are aligned by alignment means, said alignment step consisting in introducing within the terminal connector of the first cable at least one centering pin into a longitudinal opening formed in each terminal connector, the centering pin projecting from the cutting face of the terminal connector and engaging in a corresponding opening of the terminal connector of the second cable.

4,416,508

OVERHEAD ELECTRIC AND OPTICAL TRANSMISSION CABLES

Phillip Dey, New Barnet; Peter Fearns, Huyton; Karl W. Plessner, Kings Langley; Kenneth H. Pickup, Uppermill; Bernard Gaylard, Altrincham, and Arthur B. Murphy, Rainford, all of England, assignors to BICC Public Limited Company, London, England

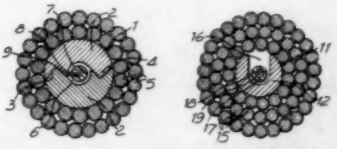
Division of Ser. No. 220,291, Dec. 29, 1980, Pat. No. 4,359,598, which is a continuation of Ser. No. 904,557, May 10, 1978, abandoned. This application May 20, 1982, Ser. No. 380,117

Claims priority, application United Kingdom, May 13, 1977, 20234/77; Jan. 24, 1978, 2861/78

The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.23 **27 Claims**



12. An overhead flexible electric transmission conductor adapted to be freely supported from spaced supports in long lengths, comprising a substantially circumferentially rigid central core having an elongate compartment constituted by a space formed within and extending throughout the length of the core, at least one separate flexible optical guide loosely housed in the elongate compartment and, surrounding the central core, at least one layer of helically wound bare elongate elements of metal or metal alloy.

4,416,509

UNIVERSAL REFLECTOR OF ELECTROMAGNETIC WAVES MOUNTED ON A FLOAT

Drndarski Milan, Evgenija Kumicica br. 12, 24000 Subotica, Yugoslavia

Filed May 20, 1981, Ser. No. 265,641

Claims priority, application Yugoslavia, May 26, 1980, 1416/80

Int. Cl.³ G02B *5/122*

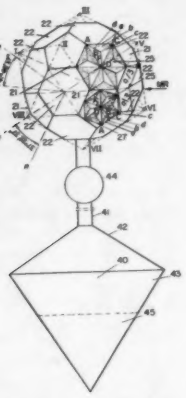
U.S. Cl. 350—102 **5 Claims**

1. A reflector for electromagnetic radiation which reflects radiation from any arbitrary angle in three dimensions in paral-

lel to incoming radiation to within approximately ±20°, said reflector comprising:

(a) a reflector body in the shape of a modified icosahedron having twenty regular hexagonal surfaces and twelve regular pentagonal surfaces;

(b) six regular trilateral pyramids formed on each of the twenty regular hexagonal surfaces, one edge of each of the trilateral pyramids being one edge of the associated



hexagonal surface and the vertex of the trilateral pyramid opposite said one edge thereof being the center of the associated hexagonal surface; and

(c) six regular trilateral pyramids formed on each of the twelve regular pentagonal surfaces, one edge of one of the trilateral pyramid being a part of one edge of the associated pentagonal surface and the vertex of the trilateral pyramid opposite said one edge thereof being the center of the associated pentagonal surface.

4,416,510

RETROREFLECTIVE STRUCTURE AND METHOD OF MANUFACTURING THE SAME

Ludwig Eigenmann, Vacallo, Switzerland

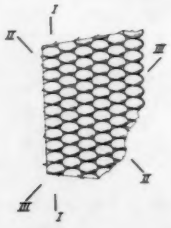
Continuation of Ser. No. 6,503, Jan. 25, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 235,141

Claims priority, application Italy, Jan. 31, 1978, 19827 A/78

The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.

Int. Cl.³ G02B *5/128*

U.S. Cl. 350—106 **20 Claims**



1. A method of manufacturing a retroreflective roadway pavement regulating sign of the type comprising retroreflectors adapted to reflect light beams impinged thereon by automobile carried source of light, comprising the steps of providing a primary planar material including a larger quantity of elementary retroreflectors; and forming from the primary planar material elementary retroreflective elements each including a a smaller quantity of the interconnected elementary retroreflectors each being elongated in plane view and asymmetrical in a vertical plane and the plane view.

4,416,511

PROJECTION SCREEN ARRANGEMENT

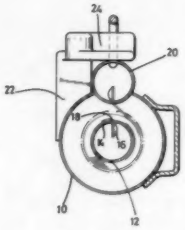
Ulli Weinberg, Roth, Fed. Rep. of Germany, assignor to Reflecta GmbH Foto Film Projektion, Schwabach, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 358,182

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1981, 3115177

Int. Cl.³ G03B *21/56*

U.S. Cl. 350—117 **7 Claims**



1. A projection screen arrangement comprising a housing; a roller rotatably disposed in the housing and carrying a projection screen extendible from and retractible into the housing by being unwound from and wound on to the roller; spring means loading the roller in the winding-in direction; at one end of the housing, a rotary actuating member which is non-rotatably connected to the roller and which is actuable from the outside of the housing for tensioning the screen when in the extended position; a terminal bar member at the end of the screen remote from the roller; a push member radially displaceably mounted in the housing and adapted to be engaged by the terminal bar member when the projection screen is in the fully wound-in condition; spring means urging the push member away from its actuated position; a detent member which is displaceable by the push member; and a detent means which is non-rotatably connected to the rotary actuating member and co-operable with the detent member when the push member is actuated, thereby to arrest the roller in the winding-in direction.

4,416,512

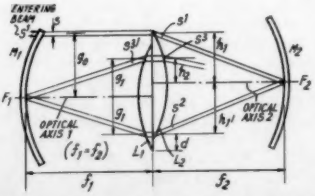
NON-MECHANICAL ELECTROMAGNETIC SCANNING DEVICE

Brett J. Sinclair, P.O. Box 11415, Denver, Colo. 80211

Continuation of Ser. No. 159,898, Jun. 16, 1980. This application Jun. 7, 1982, Ser. No. 385,750

Int. Cl.³ G02B *27/10, 27/17*

U.S. Cl. 350—171 **3 Claims**



1. In a system, for use in a non-mechanical electromagnetic

scanning device having a source of pulsed beams of electromagnetic energy, said system comprising:

(i) first and second opposed mirrors disposed in spaced relationship

(ii) means disposed between said mirrors to offset, at each pass of the beam between said mirrors, a pulsed beam directed onto one of said mirrors and reflected thereby towards the other of said mirrors, thereby to result in a plurality of successively offset passes of pulsed beam,

the improvement that, in combination:

(a) said second mirror is less than wholly reflective over all of its reflective surface whereby a portion of the beam at each said pass towards said second mirror emerges through said less than wholly reflective second mirror

(b) said mirrors are of the same focal length and have their optical axes parallel

(c) said offsetting means serve to offset each said pass of the beam normal to said optical axes, and

(d) said beam is refocused at each said pass so as to maintain uniform spot diameter,

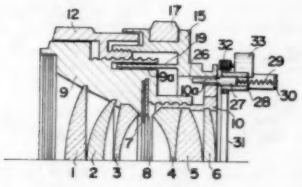
whereby the portions of beam emerging through said second mirror from a linear scan pattern.

4,416,513

AUTOMATIC AND MANUAL FOCUS CONTROL FOR OBJECTIVE LENS ASSEMBLY

Kyozo Uesugi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 10, 1980, Ser. No. 167,303
Claims priority, application Japan, Jul. 16, 1979, 54-90510
Int. Cl.³ G02B 7/04; G03B 3/00
U.S. Cl. 350—255 **13 Claims**



1. An objective lens assembly for use with a camera which includes an automatic focus control device having a driving mechanism, comprising:

a manually movable focussing ring;

first and second lens groups disposed along a common optical axis, said first and second lens groups being capable of changing focus not only when said both lens groups are concurrently shifted along the optical axis but also when either one of said lens groups is shifted relative to the other along the optical axis;

a first movable barrel carrying said first lens group;

a second movable barrel carrying said second lens group, said second movable barrel being movably supported by said first movable barrel so as to be integrally moved with said first movable barrel;

first means interconnecting said manual focussing ring with said first movable barrel such that said first movable barrel is moved along the optical axis in response to the movement of said manual focussing ring, thereby moving said first and second lens groups concurrently along the optical axis; and

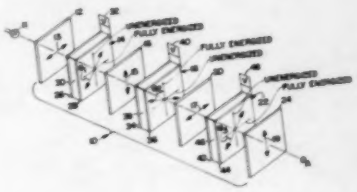
means for interconnecting said second movable barrel to said driving mechanism so that said second movable barrel is automatically moved, thereby said second lens group being moved relative to the first lens group along the optical axis.

4,416,514

COLOR FILTER

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 10, 1980, Ser. No. 205,660
Int. Cl.³ G02F 1/13
U.S. Cl. 350—335 **31 Claims**



1. A filter for varying the spectral composition of visible light, said filter comprising:

a plurality of different dichroic polarizers stationed along an optical path to intercept light traveling therealong, each of said dichroic polarizers structured for selectively plane polarizing a different part of the visible spectrum while transmitting the remainder of the visible spectrum unpolarized;

a plane polarizer stationed along said optical path for polarizing substantially uniformly all wavelengths of the visible spectrum; and

a plurality of voltage responsive twisted nematic liquid crystals one for each of said dichroic polarizers, said twisted nematic liquid crystals being stationed along said optical path and structured for varying the rotation of linearly polarized light in accordance with the voltage applied thereto,

said dichroic polarizers, said plane polarizer, and said twisted nematic liquid crystals being arranged along said optical path in a predetermined sequence and azimuthal orientation to modify the spectral content of visible light incident to said filter so that said filter transmits any one of a predetermined number of colors whose saturation and hue are related to the voltages applied to said twisted nematic liquid crystals.

4,416,515

OPTICAL FILTER IN FLUORESCENT LIQUID CRYSTAL DISPLAY DEVICES

Fumiaki Funada, Yamatokoriyama; Masataka Matsuura, Tenri, and Tomio Wada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 956,969, Nov. 2, 1978, abandoned. This application Mar. 23, 1981, Ser. No. 246,182
Claims priority, application Japan, Nov. 7, 1977, 52-133849
Int. Cl.³ G02F 1/13
U.S. Cl. 350—350 F **5 Claims**

1. A fluorescent liquid crystal display having a display side and a rear side comprising:

a pair of substrates including a rear substrate and a display side substrate;

liquid crystal material interposed between said pair of substrates;

a fluorescent material mixed within said liquid crystal material for producing fluorescence;

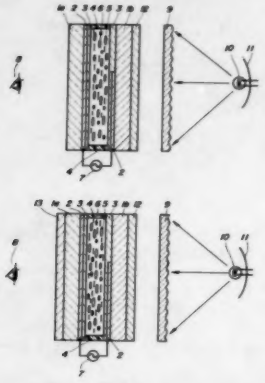
an exciting source at said rear side of said display for emitting exciting radiation to stimulate the fluorescent material to produce said fluorescence;

a diffusing plate interposed between the exciting source and said rear substrate;

the wavelength of the fluorescence being different from the wavelength of the exciting radiation, the fluorescent mate-

rial having a high absorption coefficient with respect to the exciting radiation;

first filter means between said diffusing plate and said rear substrate for controlling the propagation of the exciting radiation from said rear side to said display, said first filter means permitting the exciting radiation capable of being absorbed by the fluorescent material to pass therethrough and preventing the exciting radiation having a wavelength



which is substantially equal to the wavelength of the fluorescence from passing therethrough and preventing said fluorescence from passing therethrough to said rear side of said liquid crystal display; and

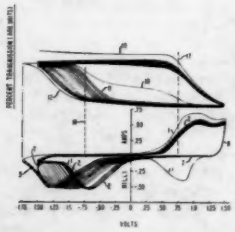
second filter means adjacent said display side substrate for permitting passage of said fluorescence therethrough and for preventing the exciting radiation not absorbed by said fluorescent material from passing therethrough.

4,416,516

MATRIX ADDRESSABLE ELECTROCHROMIC DEVICES

Gerardo Beni, Old Bridge, and Lawrence M. Schiavone, Howell, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 14, 1981, Ser. No. 254,076
Int. Cl.³ G02F 1/17
U.S. Cl. 350–357 **7 Claims**



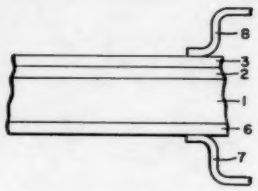
1. A display comprising a plurality of elements and means for selectively changing the optical properties of said elements wherein said elements comprise an electrochromic electrode, an electrolyte, and a counterelectrode wherein a surface of a region of said electrochromic electrode and a surface of a region of said counterelectrode contact said electrolyte characterized in that said electrochromic electrode comprises electrochromic iridium oxide and said surface of said region of said counterelectrode contacting said electrolyte is essentially devoid of compositions other than tantalum oxide and high resistivity materials.

4,416,517

ELECTROCHROMIC DEVICES INCLUDING A MICA LAYER ELECTROLYTE

George H. Beall, Big Flats, and Francis P. Fehlner, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 218,937, Dec. 22, 1980, abandoned. This application Feb. 18, 1982, Ser. No. 350,122
Int. Cl.³ G02F 1/17
U.S. Cl. 350—357 **13 Claims**



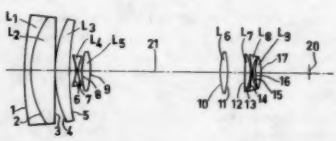
1. A electrochromic device comprising at least one solid inorganic electrochromic layer, a solid electrolyte layer in contact with the electrochromic layer which is permeable to cations but substantially impermeable to electrons, and electrode means for applying an electrical potential across the electrolyte and electrochromic layers, characterized in that the solid electrolyte layer comprises polycrystalline mica, the mica crystals in the layer not exceeding about 20 microns in their largest dimension and containing at least one species of exchangeable interlayer cation selected from the group consisting of Na^+, Li^+ and H^+.

4,416,518

OBJECTIVE COMPRISING ASPHERICAL SURFACES, WHOSE FOCAL LENGTH IS VARIABLE OVER A WIDE RANGE

Edgard A. Hugues, Courbevoie; Jean-Marie Bacchus, Bagnolet, both of France, and Jan Haisma, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 29, 1980, Ser. No. 192,158
Claims priority, application France, Sep. 28, 1979, 79 24154
Int. Cl.³ G02B 13/18, 15/14
U.S. Cl. 350—427 **10 Claims**



1. A variable focal length objective lens for focusing an image of an object at a stationary image plane, said lens having an aperture number between 1.5 and 2 and comprising components, each having at least one lens element, arranged along an optical axis, including:

(a) first and second stationary components arranged in order between an object field and the stationary image plane, said components having positive focal lengths; and

(b) first and second movable components each comprising a single element, arranged in order between the first and second stationary components, said first movable component having a negative focal length and said second movable component having a positive focal length, at least one of said

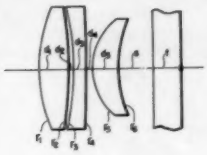
single elements having an aspherical surface, said movable components being axially displacable relative to each other to effect a focal length variation of at least 5 to 1.

4,416,519

OBJECTIVE FOR VIDEO DISKS

Yuko Kobayashi, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1981, Ser. No. 294,826
Claims priority, application Japan, Sep. 2, 1980, 55-120645[U]
Int. Cl.³ G02B 9/14, 21/02
U.S. Cl. 350—475 **7 Claims**



1. An objective for video disks consisting of a first, second and third lenses, said first lens being a positive lens, said second lens being a negative lens, said third lens being a positive meniscus lens having a concave surface on the video disk side, said objective for video disks satisfying the following conditions:

(1) $1.5 < f_{12}/f_3 < 3.0$

(2) $0.7f < D < 1.65f$

wherein reference symbol f represents the focal length of the lens system as a whole, reference symbol f_{12} represents the composite focal length of the first and second lenses, reference symbol f_3 represents the focal length of the third lens, and reference symbol D represents the overall length of the lens system, and

in which said objective for video disks has the following numerical data:

$r_1 = 1.5700$			
$d_1 = 0.3355$	$n_1 = 1.69981$	$\nu_1 = 29.51$	
$r_2 = -4.5434$			
$d_2 = 0.0530$			
$r_3 = -2.8939$			
$d_3 = 0.1395$	$n_2 = 1.74132$	$\nu_2 = 26.52$	
$r_4 = -28.7100$			
$d_4 = 0.0698$			
$r_5 = 0.6472$			
$d_5 = 0.3070$	$n_3 = 1.76300$	$\nu_3 = 25.68$	
$r_6 = 1.2643$			
$f = 1$			
$t = 0.3349$			

$f_{12} = 2.614$, $f_3 = 1.430$ $\Big\}$ $\dfrac{f_{12}}{f_3} = 1.83$

$D\ (= d_1 + d_2 + d_3 + d_4 + d_5) = 0.905$

$s = 0.48$

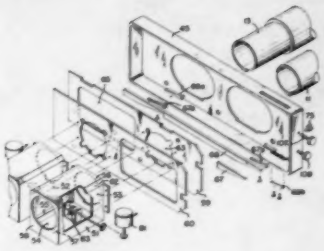
wherein reference symbols r_1 through r_6 respectively represent radii of curvature of respective lens surfaces, reference symbols d_1 through d_5 respectively represent thicknesses of respective lenses and airspaces between respective lenses, reference symbols n_1, n_2 and n_3 respectively represent refractive indices of respective lenses at $\lambda = 830$ nm, reference symbols ν_1, ν_2 and ν_3 respectively represent Abbe's numbers of respective lenses for d-line, reference symbol t represents the thickness of cover glass, reference symbol s represents the working distance.

4,416,520

SLIDE PROJECTOR HAVING TWO IMAGE-PROJECTION SYSTEMS WHICH OPERATE WITH A SINGLE SLIDE TRAY

Milo G. Kramer, Mukilteo, Wash., assignor to Source Technologies Corporation, Mukilteo, Wash.

Filed Jul. 24, 1981, Ser. No. 286,709
Int. Cl.³ G03B 21/20, 21/26
U.S. Cl. 353—101 **4 Claims**



1. In a multiple image slide projector which includes a projector housing and first and second image projection systems which in turn each include a projection lens, a portion of the projection lens being within the projector housing, wherein each image projection system projects slides acquired from a slide tray onto a screen, an apparatus for precisely aligning the images on the screen, comprising:

mounting boxes positioned within the projector housing for supporting each projection lens, said mounting boxes substantially surrounding the longitudinal dimension of the portion of its projection lens which is within the projector housing;

mounting plates for each mounting box, secured to the front end of the mounting box, the mounting plates having an opening therein through which the projection lens extends;

means within the projector housing for supporting said mounting plates in the vicinity of the front of the projector for lateral movement thereof; and

means for moving the images on the screen by moving at least one of said mounting plates, which in turn results in corresponding movement of the mounting box secured thereto and its projection lens, the direction of movement of said one mounting plate being at a substantially right angle to the longitudinal axes of the image projection systems.

4,416,521

SYSTEM AND METHOD FOR DETERMINING THE LIGHT TRANSMISSION CHARACTERISTICS OF COLOR PICTURE TUBE SHADOW MASKS

Ernesto J. Alvero, and William R. Kelly, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed May 28, 1981, Ser. No. 267,749
Int. Cl.³ G03B 41/00
U.S. Cl. 354—1 **7 Claims**

1. A system for determining the exposure time required to expose the screen of a television panel in accordance with the light transmission characteristics of the shadow mask associated with said screen comprising:

means for providing the actual transmission characteristics of said shadow mask;

means for providing a minimum acceptable transmission value;

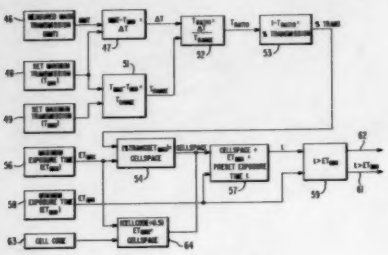
means for providing the maximum acceptable transmission value;

means responsive to said actual transmission characteristics

and said minimum transmission value for providing a transmission difference signal;

means responsive to said minimum transmission value and said maximum transmission value for providing a transmission range signal in accordance with the difference of said values;

means responsive to said transmission difference signal and



said transmission range signal for providing a transmission ratio;

means responsive to said transmission ratio for providing a transmission percentage;

means for providing a maximum transmission time; and

means responsive to said transmission percentage and said maximum transmission time for providing said exposure time.

4,416,522

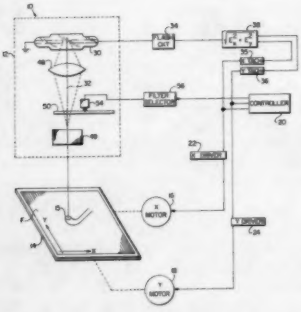
DAYLIGHT PHOTOPLOTTING AND FILM THEREFOR

Ronald B. Webster, Ellington, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Jan. 25, 1982, Ser. No. 342,195

Int. Cl.³ G03B *41/00*

U.S. Cl. 354—4 **8 Claims**



1. An apparatus for recording color images comprising:

a color film including a sheet material and a plurality of emulsion layers in overlying relationship superimposed on and adhering to the sheet material, each emulsion layer sensitive only to exposure by predetermined wavelengths of non-visible radiant energy, the predetermined wavelengths of each emulsion being different from the predetermined wavelengths of the other emulsions, and each emulsion layer being developable to manifest a distinguishable color different from the other emulsion layers upon exposure to sensitizing radiant energy,

a support surface on which the color film is spread,

a first source of non-visible radiant energy, the radiant energy including wavelengths to which a first of the emulsion layers of the color film is sensitive, and not including wavelengths to which a second emulsion layer is sensitive;

a second source of non-visible radiant energy, the radiant energy of the second source including wavelengths to which the second emulsion layer of the film is sensitive and not including wavelengths to which the first emulsion layer is sensitive,

means for bringing the first and second sources separately into registration with a beam axis;

means for projecting the radiant energy emitted from the sources along the beam axis and onto a spot on the film surface,

support means for supporting the radiant energy sources and the projecting means so that the beam axis is generally perpendicular to the support surface, and

means for moving the film and spot relative to one another to expose locations on the film in accordance with a desired plot.

4,416,523

AUTOMATIC FOCUSING SYSTEM

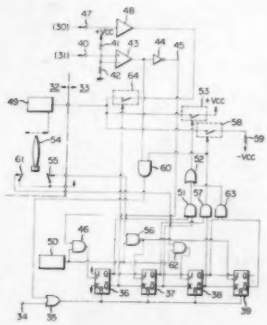
Takashi Kawabata, Kamakura, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1982, Ser. No. 380,438

Claims priority, application Japan, May 28, 1981, 56-81336; May 29, 1981, 56-82668

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—25 **17 Claims**



1. An automatic focusing system including:

(A) focus adjustable lens means;

(B) focus detecting means for detecting the focus adjusted state of said lens means and producing an output indicative of the focus adjusted state of said lens means;

(C) adjust means for adjusting the focus of said lens means on the basis of the output of said focus detecting means;

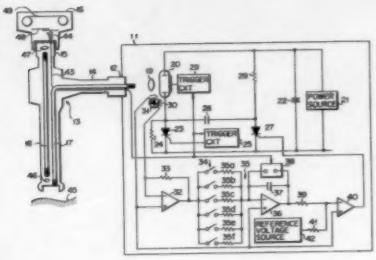
(D) discriminating means for discriminating whether the focus detection by said focus detecting means is sufficiently possible at a position whereat said lens means is currently placed, said discriminating means producing a characteristic output when the focus detection by said focus detecting means is not sufficiently possible; and

(E) shift means for forcibly shifting said lens means to a predetermined position in response to the characteristic output of said discriminating means, said shift means having a control circuit for shifting said lens means to another position when the characteristic output is still being produced by said discriminating means with said lens means forcibly shifted to said predetermined position.

4,416,524
LIGHT SOURCE DEVICE FOR AN ENDOSCOPE

Syuichi Takayama, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 193,649, Oct. 3, 1980, abandoned. This application Apr. 20, 1982, Ser. No. 370,087
Claims priority, application Japan, Oct. 13, 1979, 54-132001
Int. Cl.³ G03B *15/05, 29/00;* A61B *1/06;* H05B *41/14*
U.S. Cl. 354—31 8 Claims



1. A light source device for an endoscope having an endoscope camera coupled thereto, comprising:

a source of power:

an electronic flash unit coupled to said source of power for emitting light in response to a synchro-signal of an endoscope camera;

means for directing light from said electronic flash unit to a subject to be photographed;

a photoreceptor, disposed adjacent said electronic flash unit with a direct, unimpeded light path between the photoreceptor and said electronic flash unit, for directly receiving light from the electronic flash unit and for converting the directly received light into an electrical output signal which is a function of the amount of directly received light of the photoreceptor;

a light emission amount calculating circuit connected to the photoreceptor for performing a calculation on said electrical output signal of said photoreceptor, said light emission amount calculating circuit including means for manually setting a calculation constant to obtain a desired substantially constant amount of light to be emitted by said electronic flash unit, and means for generating an output signal as a result of said calculation, which output signal corresponds to said desired substantially constant amount of light; and

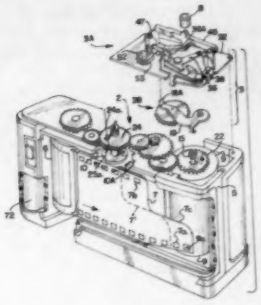
means coupled to said light emission amount calculating circuit and to said electronic flash unit for stopping a light emission of said electronic flash unit responsive to said output signal of said light emission amount calculating circuit to thereby emit said substantially constant amount of light irrespective of the distance to a subject or a lowering in emission efficiency of said electronic flash unit or a lowering in power source voltage.

4,416,525
AUTOREWINDING SELF-THREADING CAMERA

Kowk Y. Chan, North Point, Hong Kong, assignor to W. Haking Enterprises Limited, Hong Kong, Hong Kong

Filed Jul. 13, 1981, Ser. No. 282,722
Int. Cl.³ G03B *1/18*
U.S. Cl. 354—173 31 Claims

1. In a camera utilizing a 35 mm-type cassette film dispenser including a cassette housing containing a filmstrip having edge perforations and a film leader extending from the cassette housing, said camera having a film compartment covered by a door; a take-up spool in said compartment; motor means for driving said take-up spool; a film engaging rotary sprocket means disposed in advance of said take-up spool to engage said perforations during film movement; film capturing means on said take-up spool for engaging and capturing at least one of said perforations when said take-up spool is rotated in a film advancing direction; and transmission means for coupling said energized motor means to said take-up spool and to said sprocket means to propel said film towards said capturing means on the take-up spool when the leader on the filmstrip is placed over said driven sprocket means and at a speed slower than said capturing means is moved by said take-up spool; the

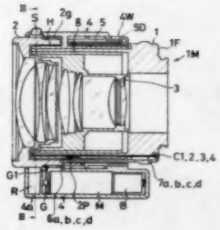


improvement wherein there is provided repeatedly manually operable means not requiring the opening of said door for energizing said motor drive means each time it is operated for a predetermined period to advance the film at least one film frame after the initial loading of the film and before said film leader is wound on the take-up spool to the extent that an unexposed frame is in position to be exposed, to increase the likelihood that said capturing means can capture a film perforation if it fails to do so on the first operation of said manually operable means.

4,416,526
INTERCHANGEABLE LENS BARREL

Yasumasa Tomori, Sakado, and Mitsuhiko Shimoda, Asaka, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1981, Ser. No. 267,568
Claims priority, application Japan, Jun. 11, 1980, 55-78859
Int. Cl.³ G03B *3/10;* G02B *7/04*
U.S. Cl. 354—198 7 Claims



1. An interchangeable lens barrel comprising a mount securing lens barrel having a mount which can be attached to a mount of a camera body, focusing lens means rotatably supported on the mount securing lens barrel and moving in directions of the optical axis when it rotates, a driving circuit having a driving motor, a driving mechanism connected to the driving motor for rotating the focusing lens means, outside actuation switch means provided in the driving circuit of the driving motor, signal transmitting and receiving means for receiving a driving signal of the driving motor from the camera body, said

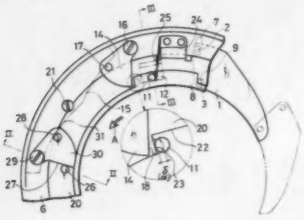
signal transmitting and receiving means being provided on the portion of the mount securing lens barrel that is opposed to the mount of the camera body, said signal means including a plurality of sliding contacts connecting said drive motor on the lens barrel with the driving circuit regardless of the axial displacement of the lens barrel from the mount.

4,416,527

APPARATUS OF PREVENTING BOUND OF DIAPHRAGM BLADES IN CAMERA

Zenichi Okura, Ichikawashi, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1982, Ser. No. 385,079
Claims priority, application Japan, Jun. 22, 1981, 56-92027
Int. Cl.³ G03B *9/06*
U.S. Cl. 354—272 **13 Claims**



1. In a diaphragm actuator of a lens of a camera, comprising a stationary support ring, a blade ring which is rotatable in and relative to the support ring and which has a plurality of diaphragm blades rotatable thereto by means of pivots, said diaphragm blades being movably connected to said support ring so that the rotational movement of the blade ring relative to the support ring causes the diaphragm blades to open and close in order to control a diaphragm opening defined by the diaphragm blades, and an angular displacement limiting member which limits the angular displacement of the blade ring to control the diaphragm opening in accordance with a predetermined aperture F number of the associated lens, said blade ring being rotated until it is brought into contact with the limiting member when the diaphragm blades are closed, the improvement comprising an apparatus for preventing the blade ring from bounding when the blade ring comes into contact with the limiting member, said bound preventing apparatus comprising a bound preventing ring which is rotatable relative to the support ring and which comes into contact with the blade ring to brake the movement of the blade ring immediately before the blade ring comes into contact with the limiting member.

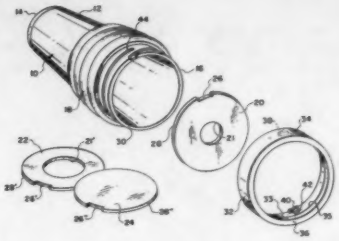
4,416,528

CAMERA LENS ACCESSORY MOUNTING CONSTRUCTION

Steven M. Breslau, Evanston, Ill., and M. Gary Grossman, Fort Lee, N.J., assignors to Sima Products Corporation, Chicago, Ill.

Filed Jun. 17, 1982, Ser. No. 389,220
Int. Cl.³ G03B *11/06*; G02B *7/00*
U.S. Cl. 354—296 **8 Claims**

1. A camera lens accessory and mounting device for positioning and locking one or more accessories at a front end of the lens comprising, at least one accessory having a perimeter edge, a notch formed in said accessory along said edge, a mounting ring, said ring including a pair of oppositely-facing lugs extending radially within the ring from the inner-facing circumference thereof, said accessory being positionable within said ring to be retained therein by said lugs, and said



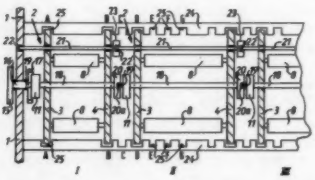
ring with accessory positioned therein being mountable to said front end of the lens to retain the accessory thereon.

4,416,529

RACKS FOR DEVELOPING AND/OR FIXING FILM

Alfons Kastl, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 27, 1982, Ser. No. 372,102
Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119318
Int. Cl.³ G03B *3/08*
U.S. Cl. 354—320 **20 Claims**



1. An arrangement for processing radiation-sensitive articles, particularly for developing and fixing film, comprising:

(a) a container for accommodating a processing medium for radiation-sensitive articles;

(b) a first conveying device for conveying radiation-sensitive articles having first dimensions along a first path;

(c) a second conveying device for conveying radiation-sensitive articles having second dimensions different from said first dimensions along a second path, said devices having different dimensions;

(d) guide means in said container for removably positioning said devices therein, said devices being receivable in said container simultaneeously, and said guide means being arranged to position said devices such that said paths are out of alignment with one another;

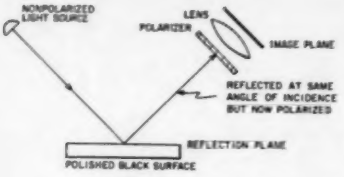
(e) a drive for said devices; and

(f) coupling means for coupling said devices to one another and to said drive in such a manner that one of said devices transmits driving force from said drive to the other of said devices, said coupling means comprising a driving member on each of said devices adapted to be coupled to said drive, first coupling elements on said driving members, and second coupling elements connected with said driving members and arranged to mate with said first coupling elements.

4,416,530
POLARIZING FILTERS FOR ENHANCING CONTRAST IN XEROGRAPHIC COPYING MACHINES

Richard D. Hebert, and Daniel J. Lasky, both of San Jose, Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 358,369
Int. Cl.³ G03G 15/00
U.S. Cl. 355—3 R 24 Claims



1. In a photocopying apparatus, comprising a light source, a reflection plane, optical elements to focus the light and an image plane;

the improvement comprising;

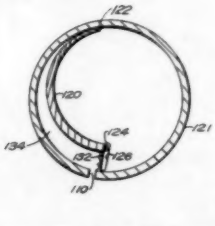
a light polarizing means juxtaposed between said reflection plane and said image lane;

whereby specularly reflected polarized light from said reflection plane directed toward said image plane is prevented from being incident upon said image plane by said polarizing means.

4,416,531
ELECTROPHOTOGRAPHIC COPYING APPARATUS AND SUBSYSTEMS THEREFOR

Edward F. Mayer, San Jose, Calif., assignor to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 199,096, Oct. 20, 1980, Pat. No. 4,384,784.
This application Apr. 2, 1982, Ser. No. 364,653
Int. Cl.³ G03G 15/00
U.S. Cl. 355—3 TR 13 Claims

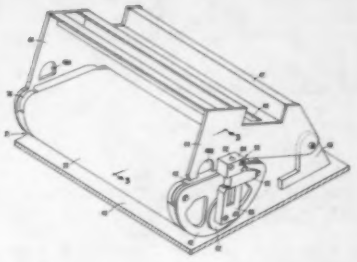


1. An electrophotographic copying apparatus including a photosensitive surface movable cyclically past a plurality of processing stations and adapted to retain for at least two cycles thereof an electrostatic latent image formed on said photosensitive surface by exposing charged portions of said surface to a light image of an orignal, said stations including a developing station having means for applying a developing powder to said latent image to form a powder image of said original and a transfer station for bringing a copy sheet into registry with said powder image for transferring said powder image thereto, said transfer station including a roller adapted to rotate adjacent said surface in synchronism therewith and including holes extending inwardly to pressure means forming a low pressure on the surface of said roller for holding a copy sheet thereto to bring it into contact with said powder image and later forming a higher pressure on said roller surface for releasing said copy sheet.

4,416,532
LATCHING AND TENSIONING MECHANISM FOR CLOSED-LOOP BELT SUPPORTING CAPSTAN

Alfonso A. Rosati, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 11, 1982, Ser. No. 387,720
Int. Cl.³ G03G 15/00
U.S. Cl. 355—3 BE 5 Claims



1. In a copier having a flexible belt guide frame attached at one end in cantilever fashion to the copier base with said guide frame including a bar movably mounted for applying outwardly directed tension to the inner face of the belt when the belt is positioned over said guide frame, an improvement comprising:

interlock receiving means on said copier base located in proximity to the end of said guide frame opposite said cantilever fashion attached end,

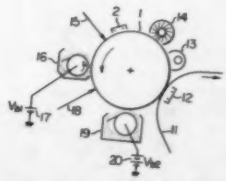
a member having an arm with interlocking means and means for moving said belt tensioning bar thereon, and

means mounting said member to said guide frame opposite end for rotation between (i) a first position wherein said base interlock receiving means and said arm interlocking means engage for securing said guide frame opposite end to said copier base while said belt moving means of said arm actuates said bar in a belt-tensioning direction, and (ii) a second position wherein said arm interlocking means is disengaged and said belt moving means causes said bar to release belt tension, said member and said mounting means being cooperatively interrelated for locating said member clear of said guide frame opposite end when in said second position.

4,416,533
NONIMPACT PRINTER

Kazuyoshi Tokunaga, Katsuta, and Masayasu Anzai, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 93,034, Nov. 9, 1979, abandoned. This application May 19, 1982, Ser. No. 379,913
Claims priority, application Japan, Dec. 19, 1978, 53-155791
Int. Cl.³ G03G 15/01, 15/08
U.S. Cl. 355—4 11 Claims



1. A nonimpact printer comprising: a recording medium movable in a predetermined direction; single charging means

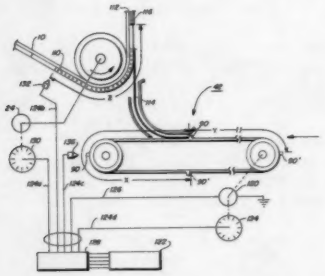
for uniformly charging said recording medium; means for forming a first latent image of electric charges on said recording medium; first developing means for developing said first latent image into a first visible image; means for forming a second latent image of electric charges on said recording medium with said first visible image formed thereon; and second developing means for developing said second latent image into a second visible image having a color different from that of said first visible image, the bias voltage for said second developing means being set higher than the bias voltage of said first developing means, said single charging means, said first latent image forming means, said first developing means, said second latent image forming means, and said second developing means being arranged, in that order, in the direction of movement of said recording medium whereby a visible image of a plurality of colors is formed on said recording medium during one cycle of movement of said recording medium.

4,416,534

APPARATUS AND METHOD FOR REGISTERING COPY SHEETS IN A VARIABLE PITCH REPRODUCTION MACHINE

Jacob N. Kluger, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 5, 1981, Ser. No. 318,300
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 SH **9 Claims**



1. In a reproduction machine for copying images from a variable pitch moving image source onto a moving copy sheet, apparatus for synchronizing sheet and image registration comprising:

(a) means for moving the sheet into image transfer relationship with the source to transfer an image to said sheet;

(b) means for generating speed signals related to the speed of said source and said copy sheet respectively;

(c) means for monitoring the position registration of said copy sheet with respect to an image on said source; and

(d) control means coupled to outputs from said means for generating and said means for monitoring to compare the difference if any between position and speed registration, and further coupled to said means for moving to register the image with the sheet at the point of image transfer.

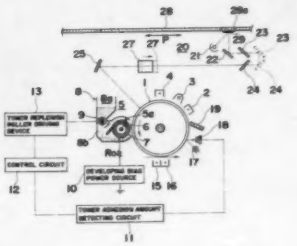
4,416,535

ELECTROPHOTOGRAPHIC COPYING APPARATUS

Takafumi Tottori, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 26, 1982, Ser. No. 382,354
Claims priority, application Japan, Jun. 8, 1981, 56-87733
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 D **5 Claims**

1. An electrophotographic copying apparatus which comprises an original document image exposure device in which original document magnification with respect to a photosensitive surface of a photoreceptor is changeable, a developing device for developing an electrostatic latent image formed on the photosensitive surface of the photoreceptor, a developing electrode provided within the developing device and grounded via an impedance element and a developing bias power source, a black reference image with white background which is arranged adjacent to a platform for the original document so that a reference latent image corresponding to the reference image is formed on the photosensitive surface of the photoreceptor, a detector for detecting amount of toner adhering to said reference latent image after development of the reference latent image by said developing device, means for replenishing toner to a developer in said developing device when the toner amount detected by the detector falls below reference toner amount, a correcting means for changing the reference toner amount and/or voltage of the developing bias power source according to an operation for changing the original document magnification.

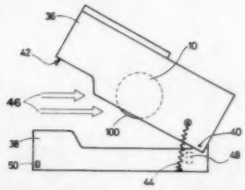


4,416,536

LIGHT MEMORY REMOVING SYSTEM IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE

Ikuo Itoh; Shunju Anzai, both of Nara, and Kunio Ohashi, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 5, 1982, Ser. No. 375,175
Claims priority, application Japan, May 12, 1981, 56-71595; May 12, 1981, 56-71597
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **5 Claims**



1. An electrophotographic copying machine comprising:

a photosensitive drum;

image forming elements disposed around said photosensitive drum, said image forming elements including a corona charging unit, an exposure unit, a developing unit, a transcription unit and an erase unit;

a housing for accommodating said photosensitive drum and said image forming elements, said housing constructed to be separated substantially along a path of a copy paper;

detection means for developing a detection signal when said housing is closed from a separated state;

light memory removing means for activating at least said transcription unit and said erase unit for removing a light mem-

ory effect developed on said photosensitive drum while said housing is separated; and

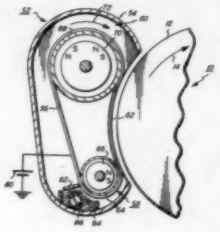
a control circuit for enabling said light memory removing means when said detection signal is developed from said detection means.

4,416,537

CLEANING SYSTEM

Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 18, 1981, Ser. No. 266,396
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—15 **15 Claims**



1. An apparatus for removing particles from a substantially rigid member, including:

flexible means, positioned closely adjacent to the rigid member defining a cleaning zone therebetween, for transporting a cleaning material into contact with the particles adhering to the rigid member;

means for maintaining said flexible means at a pre-selected tension of sufficient magnitude to compress the cleaning material and particles in the cleaning zone and to space said flexible means from the rigid member; and

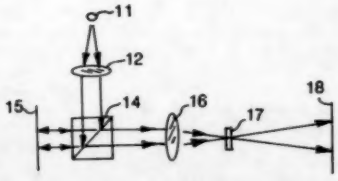
means for moving said belt toward the rigid member upon actuation of the apparatus and away from the rigid member upon de-actuation of the apparatus.

4,416,538

IMAGE ENHANCEMENT

Peter F. Mueller, Concord, and H. John Caulfield, Nagog Woods, both of Mass., assignors to Aerodyne Research, Inc., Billerica, Mass.

Filed Dec. 7, 1981, Ser. No. 328,021
Int. Cl.³ G03B *27/54*
U.S. Cl. 355—67 **7 Claims**



1. Image enhancement apparatus adapted to display increased detail in greatly lighter and greatly darker areas of a photographic film which has surface perturbations in areas of density gradations comprising

a light source,

a means to direct light from said source to a photographic film at an object plane for specular reflection from said plane,

a spatial filter,

a means to focus reflected light from said plane to a focal position substantially at said spatial filter and to direct light from said filter to an image plane,

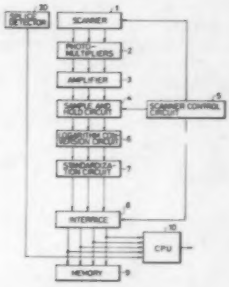
whereby scattered light from said surface perturbation and specularly reflected light from said object plane are differentiated by said spatial filter to project at said image plane an image corresponding to said surface perturbations.

4,416,539

METHOD OF LOCATING ABNORMAL ORIGINALS

Takaaki Terashita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 17, 1982, Ser. No. 389,353
Claims priority, application Japan, Jun. 22, 1981, 56-96290
Int. Cl.³ G03B *27/72*
U.S. Cl. 355—77 **6 Claims**



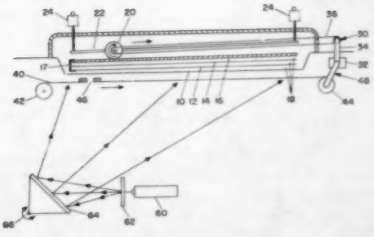
1. A method for locating an abnormal original for photographic print exposure control, comprising subjecting a number of small portions of the original to photometry, determining an average of each of one or more characteristic values determined from the measured values, for frames which are considered to be included in a series of originals, and comparing, using a plurality of said averages, to distinguish an abnormal original from a normal original.

4,416,540

APPARATUS AND METHOD FOR HOLOGRAPHIC CONTACT COPYING

Peter Nicholson, 4401 - 11th St., Long Island City, N.Y. 11101

Filed Nov. 23, 1981, Ser. No. 323,953
Int. Cl.³ G03H *1/20*
U.S. Cl. 350—3.69 **10 Claims**



1. An apparatus for producing a film copy hologram from a film master hologram containing a recorded image, comprising:

tray means having a generally clear bottom for holding a master holographic film, a blank film and a cover sheet in a substantially flat condition, with the blank film between the master film and cover sheet, and with the emulsion side of the blank film generally in contact with the emulsion side of the master film, and with the other side of said

master film generally in contact with the bottom of said tray; means for exerting pressure on the cover sheet to obtain optical contact between the cover sheet and blank film, between the blank film and master film, and between the master film and tray bottom; means for defining a slit and means for moving same across the underside of said tray; and means for generating a reconstruction beam and for directing said beam to the underside of said tray and through said slit and clear tray bottom, to thereby duplicate in the blank film the holographic image in the master film.

4,416,541

PROCESS AND DEVICE FOR THE MEASUREMENT OF A PHYSICAL QUANTITY OF AN EXTRUDED ELEMENT

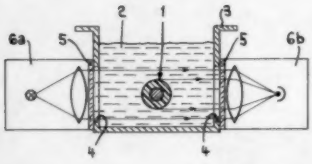
Urs P. Studer, Riehen, Switzerland, assignor to Zumbach Electronic AG, Orpund, Switzerland

Filed Apr. 30, 1981, Ser. No. 258,952

Claims priority, application Switzerland, May 8, 1980, 3593/80

Int. Cl.³ G01B *11/04*

U.S. Cl. 356—386 **6 Claims**



1. Process for automatic control of a physical quantity of an extruded element issueing from an extruder in a hot condition and cooling down gradually as it moves away from said extruder to reach a cooled condition, by means of a first and a second regulating loop in which said first regulating loop comprises the measurement of said quantity carried out on said element in the hot condition in the close vicinity of an exit of said extruder for quickly regulating and correcting variations from a first reference value and said second regulating loop comprises the measurement of said quantity carried out on said element in the cooled condition for providing an auxiliary regulation of said quantity with respect to a second reference value of said element in the cooled condition.

4,416,542

NIGHTTIME/DAYTIME DIFFUSE ATTENUATION COEFFICIENT DEVICE FOR SEAWATER

Gregory C. Mooradian, Del Mar, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 15, 1981, Ser. No. 273,785

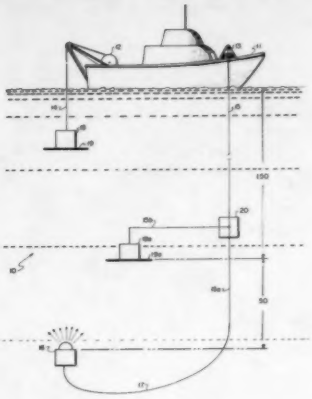
Int. Cl.³ G01N *21/17*

U.S. Cl. 356—435 **10 Claims**

1. An apparatus for measuring the diffuse attenuation coefficient of seawater during both day and night comprising:

a pulsed cosine emitter source disposed below the water's surface several scattering lengths of interest for emitting pulsed light;

a cosine response irradiance receiver interposed between the pulsed light emitting means and the water's surface being spaced from the pulsed cosine emitter source at least one scattering length of interest and facing downward for receiving irradiance from the pulsed light emitting cosine emitter source to generate responsive signals; and



a length of line coupled to the pulsed light emitting means and the irradiance receiving means for separating them a a scattering length of interest equal to fifty feet.

4,416,543

APPARATUS FOR TREATING POWDERY RUBBER MIXTURES

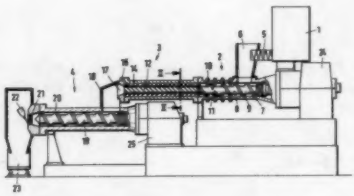
Heinz Brinkmann, Bennigsen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 1, 1981, Ser. No. 298,366

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 3036397

Int. Cl.³ B29B *1/10*

U.S. Cl. 366—80 **2 Claims**



1. Apparatus for treating powdery rubber mixtures to form processed intermediate products, said apparatus comprising a filling extruder having a rotary filling screw disposed in a filling extruder housing, and means for feeding the powdery rubber mixtures to said filling extruder housing; a mixing and plasticising housing secured to the downstream end of said filling extruder housing, said mixing and plasticising housing having teeth formed on the interior thereof and having positioned therein a central conveyor spindle having exterior teeth and rotatably coupled to the downstream end of said rotary filling screw and disposed concentrically in said plasticising housing, a plurality of axially freely movable planetary gear spindles having exterior teeth, said planetary gear spindles being symmetrically disposed around said central conveyor spindle within said plasticising housing, the teeth on said planetary gear spindles meshing with the internal teeth on said plasticising housing and the exterior teeth in said central conveyor spindle thereby causing said planetary spindles to orbit about said central conveyor spindle and provide a conveying action, said central conveyor spindle and said planetary spindle

achieving essentially pressure-less plasticisation and uniform distribution and consequent homogeneity of the components of the powdery rubber mixtures, means located in the region of the discharge end of said plasticising housing axially to locate said planetary spindles, and a forming extruder at the downstream side of said plasticising housing to process material discharged from said mixing and plasticising housing, said forming-out extruder being in cascade arrangement with said plasticising housing to receive therefrom the essentially pressure-free components homogenized in said plasticizing housing.

4,416,544

DEVICE FOR MIXING, DISPERSING AND HOMOGENIZING COMPOUNDS WITH AT LEAST ONE VISCOUS COMPONENT

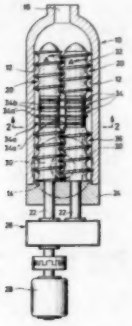
Josef A. Blach, Wilhelmstrasse 24, D-7144 Asperg, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,176

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1980, 3047314

Int. Cl.³ B29B *1/10*; B01F *7/10*

U.S. Cl. 366—85 **7 Claims**



1. In a device for mixing, dispersing and homogenizing compounds with at least one viscous component, said device exhibiting in a housing at least two parallel intermeshing shafts which can be driven in the same direction, each of said shafts having a plurality of ring disc sections disposed at an axial distance from each other, said disc sections each having at least one elevation from a circle concentric to the shaft axis, wherein the circumferential areas of the ring disc sections of the two shafts exhibiting the greatest distance from their associated shaft axes, as seen in axial direction, overlap, wherein the improvement comprises said ring disc sections being spaced axially from each other by a distance that is substantially greater than the thickness of said ring disc sections, said ring disc sections on adjacent shafts being arranged opposite one another and the axial spacings along said shafts between said ring disc sections being arrayed opposite one another.

4,416,545

MIXER

Heinz Krimmel, Ludwigsburgerstrasse 14, D-7015 Korntal-Münchingen-1, Fed. Rep. of Germany

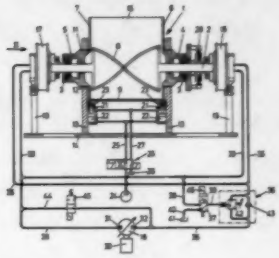
Filed Mar. 25, 1982, Ser. No. 361,766

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112685

Int. Cl.³ B01F *7/02*; B28C *1/16*

U.S. Cl. 366—99 **6 Claims**

1. A mixer having a mixing trough; rotatable mixing and kneading blades within the mixing trough; a charging and discharging opening in said mixing trough; a rotable mixing shaft connected to said blades, said trough being pivotable about the shaft; at least one motor connected to said shaft to rotate said shaft, the mixing trough being pivotable by means of the motor; and means for indexing the mixing trough in at least one pivoted position, wherein the indexing means comprises a clutch means connected to said shaft and trough to permit rotation of the trough with the shaft, and wherein the



motor comprises at least one hydraulic motor directly coupled to the mixing shaft and reversibly drivable by means of a displacement-controllable pressure pump, said clutch being connected between the mixing shaft and the mixing trough and an indexing fixing device connected to the mixing trough to fix said trough in different pivoted positions.

4,416,546

BUOYANCY-RESPONSIVE DEVICE

Malcolm F. Parkins, Elm Tree Cottage, South End, Ogbourne St. George, near Marlborough, England

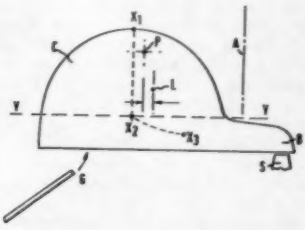
PCT No. PCT/GB81/00132, § 371 Date Feb. 23, 1982, § 102(e) Date Feb. 23, 1982, PCT Pub. No. WO82/00167, PCT Pub. Date Jan. 21, 1982

PCT Filed Jul. 3, 1981, Ser. No. 355,583

Claims priority, application United Kingdom, Jul. 4, 1980, 8022093

Int. Cl.³ B01F *13/02*

U.S. Cl. 366—102 **4 Claims**



1. A buoyancy-responsive device, for repeatedly disturbing a first fluid in which it is immersed, comprising a hollow body forming a chamber with an open mouth, which faces downwardly in a rest position of the body to collect a second, lighter, fluid rising from below, the body being pivoted about a horizontal axis and having its centre of gravity offset therefrom, so that the body by its weight tends to maintain the rest position but is capable of rotation to an unstable position, in which the mouth faces laterally, the chamber having an upper fluid-collecting portion which, in the rest position, is substantially symmetrical about a vertical plane so as to collect said lighter fluid and displace said first fluid downwardly without disturbing the body from its rest position, and the chamber also having a lower fluid-collecting portion which, in the rest position, is asymmetrical about said vertical plane and, due to buoyancy upthrust when sufficiently filled with collected

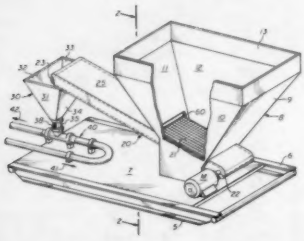
lighter fluid, exerts a turning moment about said axis, overcoming the effect of the weight thereof, to swing said body from the rest position rapidly to discharge collected fluid through the mouth, the body thereafter returning to the rest position.

4,416,547

PORTABLE PROPORTIONING DEVICE

Raymond F. Mikolajczyk, Rte. 1, Box 57-A, Broussard, La. 70518

Filed Jan. 28, 1982, Ser. No. 343,443
Int. Cl.³ B01F 15/02
U.S. Cl. 366—150 1 Claim



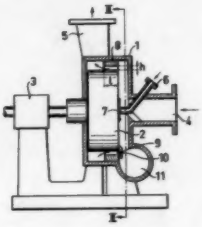
1. A rotary drilling fluid mixing arrangement including:
a. support means;
b. upright hopper means for receiving dry bulk material carried by said support means;
c. mixing hopper means carried by said support means and spaced laterally from said hopper means;
d. continuous conveyor means extending from adjacent the lower end of said upright hopper means to adjacent the upper end of said mixing hopper means, said conveyor means extending throughout the width of said upright hopper means to form the bottom surface therein;
e. means to move said conveyor means and carry dry bulk material from said upright hopper means to said mixing hopper means;
f. control means to control the amount of material on said conveyor means as it moves from said upright hopper means, said control means including:
1. an opening in a wall of said upright hopper means through which said continuous conveyor means extends; and
2. regulating means to regulate the size of the opening and thereby control the amount of bulk material which may be carried on the conveyor means from said upright hopper means to said mixing hopper means, said regulating means comprising;
(a) movable plate means;
(b) means to support said movable plate means on said upright hopper means adjacent the opening in the wall thereof; and
(c) means to raise and lower said movable plate means;
g. discharge means adjacent the lower end of said mixing hopper means;
h. liquid conducting conduit means connected to receive material from said discharge means; and
i. means to regulate the amount of dry bulk material transferred by said conveyor means from said upright hopper means to said mixing hopper means, said means including a variable speed motor to move said conveyor means.

4,416,548

APPARATUS FOR GAS OR LIQUID ADMIXTURE

Olof G. Carre, Alnö; Paul W. Josefsson, Sörberge; Lars E. Näsman, Alnö, and Stig B. H. Zetterqvist, Sundsbruk, all of Sweden, assignors to Sunds Defibrator Aktiebolag, Sweden

Filed Feb. 17, 1981, Ser. No. 234,786
Claims priority, application Sweden, Mar. 13, 1980, 8001970
Int. Cl.³ B01F 7/12
U.S. Cl. 366—168 16 Claims



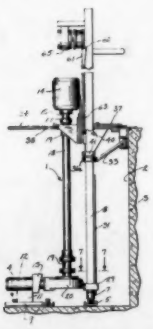
1. Apparatus for continuously mixing a fluid processing medium with a pulp suspension comprising a cylindrical rotor including a planar radial face and a cylidrical axial outer surface, a housing surrounding said rotor, said housing including a pulp suspension inlet facing the center of said substantially planar radial face of said rotor and an outlet proximate to said cylindrical axial outer surface of said rotor, gap means for forming an annular gap between said cylindrical axial outer surface of said rotor and said housing along a predetermined portion of said cylindrical axial outer surface of said rotor, said planar radial face being free of mixing protrusions and allowing a substantially unimpeded flow of said pulp suspension to permit mixing of said pulp suspension at said gap means, processing medium inlet means for feeding said fluid processing medium to said pulp suspension inlet, and turbulence creating means located at the periphery of said planar radial face of said rotor so as to create turbulence in said pulp suspension at the entrance to said annular gap.

4,416,549

APPARATUS FOR AGITATING AND PUMPING A LIQUID SLURRY

Stephen L. Kretschmer, Elk Grove Village, Ill., assignor to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Dec. 7, 1981, Ser. No. 327,792
Int. Cl.³ B01F 7/16, 15/00
U.S. Cl. 366—190 12 Claims



1. An apparatus for agitating and pumping a liquid slurry, comprising a vessel containing the liquid slurry, a fixed vertical column disposed within said vessel, a motor-pump unit

mounted for vertical movement on said column, said motor-pump unit including a pump located within the vessel for agitating and pumping the liquid slurry and a motor located a substantial distance above the pump and positioned outside the vessel, said motor-pump unit also including a driving connection between the motor and the pump, first mounting means for mounting the motor-pump unit for rotation about the axis of said column, and second mounting means connected to said motor-pump unit for mounting the motor-pump unit for tilting movement about a horizontal axis with respect to the column, said second mounting means being movable on said vertical column whereby said motor-pump unit can be moved vertically within said vessel, said motor-pump unit being movable to an upper position where the pump is located adjacent the top of the vessel and said motor-pump unit then being capable of being tilted about said horizontal axis to raise the pump to a level above the vessel.

4,416,550

DRIVE ASSEMBLY FOR A TIMEPIECE

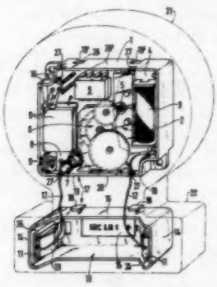
Robert Wolber, and Roland Maurer, both of Lauterbach, Fed. Rep. of Germany, assignors to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Jul. 17, 1981, Ser. No. 284,212

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 8024739

Int. Cl.³ G04B *19/00, 37/00*

U.S. Cl. 368—88 **8 Claims**



1. A timepiece drive assembly adapted to be mounted in a timepiece housing, said assembly including:

a movement casing containing a circuit board and first mating means,

a battery-receiving member having second mating means configured for removable securement with said first mating means of said casing, said battery-receiving member forming a chamber and including battery contact terminals removably secured in said chamber, and

flexible connecting wires extending between said terminals and said casing to electrically couple said terminals to said circuit board, said wires being of sufficient length to permit said battery-receiving member to be separated from said casing and positioned in spaced relationship therewith within the timepiece housing while maintaining an electric coupling between said terminals and said circuit board.

4,416,551

BATTERY MICROCALORIMETER

Kwang-Yil Kim, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 11, 1981, Ser. No. 300,878

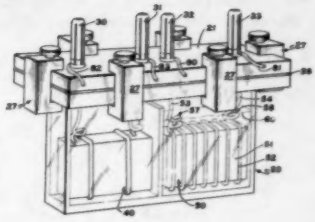
Int. Cl.³ G01K *17/00*

U.S. Cl. 374—31 **3 Claims**

1. In a calorimeter:

(a) a thin sample container having opposite faces of large area with respect to the thickness of the container, cover means for closing said container in liquid-tight relation, and terminal means carried by said cover means for making electrical connections therethrough, said container being separated by a narrow partition extending between said faces into first and second narrow chambers having surfaces which make up the faces of said container, said partition being of less height than said container;

(b) a pair of heat sinks having faces apposed to the faces of said container;



(c) a pair of thermopiles having first faces thermally engaging said faces of said container, and second faces thermally engaging said faces of said heat sinks, whereby to conduct heat from said container to said sink and give electrical outputs determined by the flow of said heat; and

(d) the nonliquid components of an electrochemical cell mounted in one of said chambers connected to said terminal means.

4,416,552

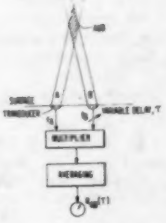
CORRELATION THERMOGRAPHY

Robert A. Hessemer, Jr., 757 Corpino De Pecho, Green Valley, Ariz. 85614, and Lloyd J. Perper, 3725 Ironwood Hill Dr., Tucson, Ariz. 85745, assignors to Robert A. Hessemer, Jr., Green Valley; Lloyd J. Perper and Theodore Bowen, both of Tucson, all of, Ariz.

Filed Oct. 15, 1981, Ser. No. 311,632

Int. Cl.³ G01K *1/00*

U.S. Cl. 374—117 **20 Claims**



1. A passive remote thermal radiation sensing and processing system for non-invasive temperature measurement of the interior of a body, said system comprising:

at least first and second directional receiving means for receiving thermally-generated energy from inside said body and generating corresponding electrical signals, each of said first and second directional receiving means having a defined directional receiving pattern and said first and second directional receiving means being adapted to be coupled with the surface of said body at different locations about said body so that their directional receiving patterns intersect;

multiplier means connected to receive the electrical signals generated by said first and second directional receiving

means for producing a product output signal proportional to the product of said electrical signals; and

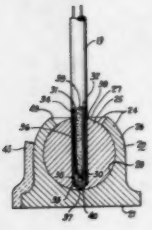
averaging means connected to said multiplier means for averaging said product output signal over a period of time to generate a correlation output signal which is a measure of the thermally-generated energy within the volume of intersection of the directional receiving patterns of said first and second directional receiving means.

4,416,553

TEMPERATURE-SENSING APPARATUS

David A. Huebscher, Maple Heights, Ohio, assignor to Noral, Inc., Cleveland, Ohio

Filed Aug. 26, 1981, Ser. No. 296,433
Int. Cl.³ G01K 1/16, 7/04
U.S. Cl. 374—165 20 Claims



1. A temperature-sensing apparatus adapted to be placed in contact with a surface for sensing the temperature of the surface comprising, in combination:

a temperature-sensitive sensor means;

manipulable support means connected to said sensor means;

conductor means connected to said sensor means and extending within said support means;

a universal joint having first and second parts with first and second interengaged surfaces thereon, respectively;

means connecting said first part to said support means to be manipulable therewith, said sensor means mounted towards an end of said connecting means near said first and second interengaged surfaces; and

a contact face adapted to engage a surface the temperature of which is to be sensed and connected to said second part whereby a heat flow path from the surface is through said contact face and said first and second interengaged surfaces to said sensor means, with said universal joint permitting said contact face to remain in engagement with the surface for a range of movement of said manipulable support means.

4,416,554

THRUST BEARING FOR ROCK BITS

Walter A. Pribbenow, Ponca City, Okla., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jul. 9, 1982, Ser. No. 396,938
Int. Cl.³ F16L 33/06; E21B 10/22
U.S. Cl. 384—95 3 Claims

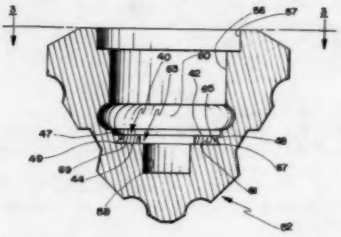
1. A rotary rock bit comprising:

a bit body having an upper end connectable to a drillstring,

at least one bearing journal extending from an opposite end of said body, said bearing journal defining at least one radially disposed bearing surface thereby,

a cutter cone rotatably positioned on said journal, said cutter cone defining at least one radially disposed bearing surface, said cone bearing surface being so configured to mate with said at least one radially disposed bearing surface formed by said bearing journal, and

at least one radially disposed intermediate thrust bearing positioned between said radially disposed bearing surfaces formed by said journal and said cone, said intermediate bearing is secured between said journal and bearing by intermediate bearing retention means, wherein an outside peripheral surface formed on said intermediate radially disposed thrust bearing is chamfered and noncircular, a first noncircular outside peripheral edge formed on said intermediate thrust bearing nearest a thrust bearing cavity formed in said cone is larger than a second parallel noncircular outside peripheral edge formed on said thrust bearing nearest said radially disposed bearing surfaces formed by said journal, said chamfered surface being formed between said first and second outside peripheral edges formed on said thrust bearing, said chamfered noncircular bearing registers with a matching chamfered noncircular



cavity formed in said cone, said first outside peripheral edge of said thrust bearing is smaller than said matching chamfered noncircular cavity formed in said cone, said chamfered thrust bearing is first aligned with said cavity in said cone, said thrust bearing is subsequently placed into registering engagement with said cavity, said thrust bearing being subsequently rotated out of alignment with an opening formed in said cone forming said cavity, said chamfered surfaces formed in said thrust bearing and said cone come in contact with one another to secure said thrust bearing within said cone to prevent dislodgement of said thrust bearing from said matching cavity formed in said cone.

4,416,555

BEARING SYSTEM FOR VERTICAL TYPE ROTARY MACHINE

Shunzo Tomioka; Kinpei Okano; Masanori Matsuo; Akira Hasegawa, and Akira Kitamura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 29, 1981, Ser. No. 306,869
Claims priority, application Japan, Sep. 30, 1980, 55-135287
Int. Cl.³ F16C 17/02
U.S. Cl. 384—415 18 Claims

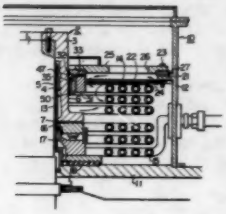
1. A bearing system for a vertical type rotary machine including a vertically extending rotor shaft, comprising:

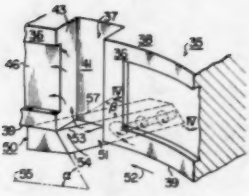
an oil tank disposed around said rotor shaft and receiving lubricating oil in said oil tank;

a guide bearing disposed around said rotor shaft in a concentric relation thereto for guiding said rotor shaft, said guide bearing having upper and lower end surfaces and a cylindrical bearing surface extending therebetween and facing the periphery of said rotor shaft with at least a lower peripheral portion of said bearing surface dipped in the oil within said oil tank, said guide bearing including a plurality of generally axially extending oil grooves formed in said bearing surface, each of said oil grooves having axial one end thereof opening into said lower end surface of said guide bearing and having a bottom surface and leading and trailing side surfaces with respect to the rotational direction of said rotor shaft;

a plurality of oil guide members with one associated with each of at least some of said oil grooves, each of said oil guide members being located adjacent to said lower end surface of said guide bearing and adjacent to said trailing

side surface of the associated oil groove, each of said oil guide members having a guide surface facing the direction of flow of the oil within said oil tank accompanied with the rotation of said rotor shaft for introducing the oil into the associated oil groove; and





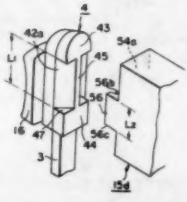
said guide surface having an upper edge adjacent to said lower surface of said guide bearing and a lower edge remote therefrom, said lower edge being advanced toward the oil flow with respect to said upper edge, and said guide surface extending radially outwardly beyond said bottom surface of said oil groove.

4,416,556

TYPE CARRIER FOR USE IN IMPACT-TYPE PRINTING MACHINES

Nobuo Iwata, Sagamihara; Koh Matsuhisa, Yokohama; Hiromi Takada, Yokohama, and Takami Suzuki, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Oct. 23, 1981, Ser. No. 314,507
Claims priority, application Japan, Jul. 20, 1981, 56-113200
Int. Cl.³ B41J *1/30*
U.S. Cl. 400—144.2 **14 Claims**



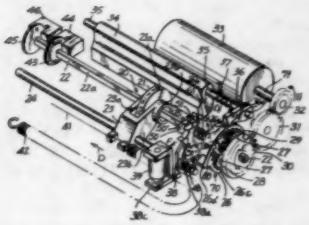
1. A type carrier for use in a printing machine, in which said type carrier is rotatably supported and rotatably driven to bring a desired type into a printing position where said desired type is impacted by a hammer to make an imprint, wherein said type carrier comprises a hub and a plurality of fingers extending generally radially from said hub, at least one of said fingers including a generally rectangularly shaped printing section defined along the lengthwise direction of the corresponding finger, said printing section including a front surface on which at least one type is provided, a first flat impact surface formed at the back surface of said printing section opposite to said front surface and having a relatively large first width extending in the direction perpendicular to the lengthwise direction of said printing section, a second flat impact surface contiguous to and lying in the same plane as said first flat impact surface and having a second width which is narrower than said first width, and a pair of sloped aligning portions extending from opposite edges of said second flat impact surface in the directions generally toward said front surface and separating away from each other and also from the plane defined by said first and second flat impact surfaces.

4,416,557

SERIAL PRINTER

Kenichiro Arai, Shiojiri, Japan, assignor to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Filed Jun. 29, 1981, Ser. No. 278,141
Claims priority, application Japan, Jul. 3, 1980, 55-91055
Int. Cl.³ B41J *7/48*
U.S. Cl. 400—152 **13 Claims**



1. A serial printer for printing characters on a printing tape comprising a frame, a selecting shaft rotatably supported on said frame and motor means for rotating said selecting shaft, a printing head slidably supported on said selecting shaft for rotation therewith, said printing head having a first group of characters and at least a second group of characters alternately disposed thereon, a first ratchet rotatably supported on said selecting shaft and associated with said first group of characters, a second ratchet rotatably supported on said selecting shaft and associated with said second group of characters, said first ratchet having a plurality of first teeth, each of said first teeth corresponding in position to a given one of said characters in said first group of characters, said second ratchet having a plurality of second teeth, each of said second teeth corresponding in position to a given one of said characters in said second group of characters, pawl means pivotally supported on said frame for selective engagement with the teeth on one of said first and second ratchets, said first and second ratchets being slidably supported on said selecting shaft and being movable between a first position where said first teeth are in alignment with said pawl means for selective engagement therewith and a second position where said second teeth are in alignment with said pawl means for selective engagement therewith, said pawl means selectively engaging one of said first and second teeth after one of said first and second groups has been selected, electromagnet means for selectively pivoting said pawl means, said pawl means, when pivoted by said electromagnet means, engaging one of the teeth on one of said first and second ratchets to stop the rotation of said selecting shaft so that the character on said printing head corresponding to the tooth selected by said pawl means can be printed on said printing tape, said selecting shaft including first biasing means for biasing said first and second ratchets in said second position, a first bevel gear slidably supported on said selecting shaft for rotation therewith and a second bevel gear mounted on said printing head in meshing engagement with said first bevel gear, a printing mechanism including printing cam means coupled to

said selecting shaft for printing the character selected by said pawl means on said printing tape, said printing cam means including planet gear mechanism having a planet lever secured to said selecting shaft, said planet lever having at least one planet gear rotatably secured thereto, said printing cam means having an internal gear which meshingly engages with said planet gear, said motor means including a sun gear driven thereby which is meshingly engaged with said planet gear, said pawl means including engagement means which selectively prevents said printing cam means from rotating, said planet gear mechanism further rotating said selecting shaft when said engagement means prevents said printing cam means from rotating, said pawl means including second biasing means for biasing said pawl means in a third position where said engagement means is engaged with said printing cam means, the activation of said electromagnet means moving said pawl means into a fourth position where said pawl means meshes with the teeth on one of said first and second ratchets and said engagement means is released from said printing cam means, said print mechanism including printing hammer means pivotally coupled to said frame for pressing said printing tape against the character selected to be printed by said pawl means, and lever means coupled to said printing hammer means for pivoting same, said printing cam means pivoting said lever means when said pawl means is engaged with the teeth on one of said first and second ratchets.

4,416,558

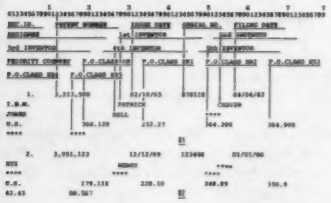
METHOD OF CONTROLLING A PRINTER IN AN INTERACTIVE TEXT PROCESSING SYSTEM TO PRINT RECORDS FROM STORED FILES OF SPATIALLY RELATED DATA

John W. McInroy; Paul D. Waldo, and Harold R. Webster, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1981, Ser. No. 264,301

Int. Cl.³ B41J *25/18*

U.S. Cl. 400—279 **6 Claims**



1. A method of printing with a printer a file of spatially related data which is stored in a text processing system and defined by a table of header data including field names and maximum field width information and wherein the records of said file are stored in a vector format including row and column designations, said method comprising the steps of:

(a) establishing for said printer the number of print positions in each line;

(b) transferring from said table of field names each field name in succession together with a number of blank padding characters determined by the maximum widths of the fields as indicated in said table;

(c) starting another print line whenever the next field name and padding characters exceed the number of print positions remaining in said line until all the header data has been transferred;

(d) storing print position data identifying where each transferred field begins; and

(e) transferring to said printer a control character prior to the transfer of each said vector formatted record to cause the data associated with each of said column designations to be aligned with the start of its corresponding field name.

4,416,559

APPARATUS, MOUNTABLE ON AN OFFICE MACHINE, FOR FEEDING SINGLE SHEETS FROM A PAPER STACK STORED IN A MAGAZINE

Helmut Steinhilber, Koenigstrasse 47, Rottweil, Fed. Rep. of Germany

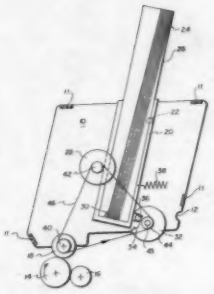
PCT No. PCT/DE80/00151, § 371 Date Jun. 16, 1981, § 102(e) Date May 27, 1981

PCT Filed Oct. 15, 1980, Ser. No. 269,007

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1979, 2941816

Int. Cl.³ B41J *13/10*

U.S. Cl. 400—629 **5 Claims**



1. An apparatus, mountable on an office machine, for feeding single sheets from a stack of paper stored in a magazine (**20**) to a platen (**14**) of the office machine having a separate-feed roller (**28**) frictionally engaging the stack of paper, having a drive wheel (**18**) driven, when the apparatus is mounted, by the platen (**14**), and having a gear mechanism (**40, 42, 46**) connecting said drive wheel (**18**) with said separate-feed roller (**28**) in such a manner that upon the rotation of the platen (**14**) counter to the paper insertion direction said separate-feed roller (**28**) is driven in the paper insertion direction, wherein

said magazine (**20**) is pivotally supported and is in engagement with a control cam (**34**), and

said control cam (**34**) is movable by said drive wheel (**18**) via said gear mechanism (**40, 42, 46**) in such a manner that upon the rotation of the platen (**14**) counter to the paper insertion direction said control cam (**34**) pivots said magazine (**20**) into a position in which the stack of paper (**24**) rests against said separate-feed roller (**28**), and upon rotation of the platen (**14**) in the paper insertion direction said control cam (**34**) pivots said magazine (**20**) into a position in which the stack of paper (**24**) does not rest against said separate-feed roller (**28**).

4,416,560

COMPUTER PRINTER CARRIAGE CONTROL APPARATUS INCLUDING AN ENCODING DISK

Douglas E. Wood, Benton Harbor; Wayne J. Kooy, Galien, and Lawrence C. Unger, Benton Harbor, all of Mich., assignors to Printek, Inc., Benton Harbor, Mich.

Filed Oct. 16, 1981, Ser. No. 311,946

Int. Cl.³ B41J *29/42*

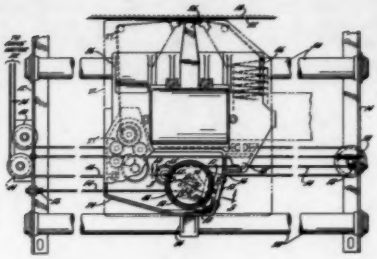
U.S. Cl. 400—705.1 **8 Claims**

1. In a computer printer for serially printing a line of printed characters having a carriage with a print head thereon, the carriage arranged on guide rails that extend parallel to the line of characters and between frame members of the printer and having a drive motor, controlled by a logic control circuit, for

driving the carriage back and forth between the frame members of the printer, a carriage control apparatus comprising

(a) an encoder disk mounted for rotation on the carriage and having a coded pattern on its periphery;

(b) sensing means for detecting the coded pattern and transmitting the pattern to the logic control circuit; and



(c) encoder disk drive means interconnecting the encoder disk and the frame members in a fixed relationship so that the rotational displacement of the encoder disk bears a fixed relationship to the position of the carriage along the line of printed characters.

4,416,561

MOUNTING ARRANGEMENT

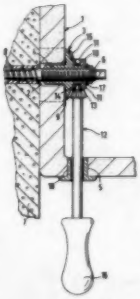
Artur Fischer, Weinhalde 34, 7244 Waldachtal 3/Tumlingen, Fed. Rep. of Germany

Filed May 4, 1981, Ser. No. 260,284

Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017749

Int. Cl.³ F16B *23/00*

U.S. Cl. 403—8 **13 Claims**



1. A mounting arrangement for mounting a sanitary object having wider and narrower adjoining cut-outs and an opening with the axis of the opening extending substantially normal to the axes of the cut-outs, to a supporting wall, the arrangement comprising a bolt member anchorable in the wall on which the sanitary object is to be mounted; a nut member having a wider portion substantially corresponding to the wider cut-out of the sanitary object and a narrower portion substantially corresponding to the narrower cut-out of the object, said nut member being formed as a collar nut having a collar which forms said wider portion and a shaft which forms said narrower portion, said nut member being screwable onto said bolt member so as to fix the object between said nut member and the wall; and means for screwing said nut member onto said bolt member for fixing the object, said screwing means including an actuating member arranged to extend through the opening of the sanitary object and to engage said nut member and to be supported by the latter so as to screw said nut member onto said bolt member and to thereby fix the object.

4,416,562

MULTI-PARTITE ASSEMBLY

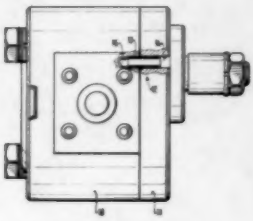
Claus Jöns, Sachsenheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 3, 1980, Ser. No. 212,672

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 7936314[U]

Int. Cl.³ F16B *17/00*

U.S. Cl. 403—13 **6 Claims**



1. A multi-partite assembly, comprising at least two parts each having a bore, one which has a larger diameter and the other of which has a smaller diameter; and a substantially cylindrical centering element received in said bores and having an outer diameter equal to the diameter of said one bore, said element being slidably received in said one bore and with a friction-fit in the other of said bores so as to align the same.

4,416,563

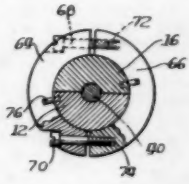
SHAFT COUPLING DEVICE

Edward H. Zemke, Chicago; Kenneth L. Guenther, Park Ridge, and Friedrich W. Baethke, Chicago, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Mar. 29, 1982, Ser. No. 362,778

Int. Cl.³ F16C *3/00*

U.S. Cl. 403—14 **20 Claims**



1. A device for rigidly coupling at least two shafts comprising:

a first shaft retained within supporting means;

a coupling end on the first shaft;

a coupling piece integral with the first shaft at the coupling end;

a second shaft to be coupled to the first shaft, the second shaft retained within second supporting means;

a coupling end on the second shaft extending between the first and second supporting means;

a coupling piece integral with the second shaft at the coupling end of the second shaft which engages the first coupling piece;

releasable collar means placed around the coupling ends for rigidly joining the shafts at their coupling ends and

a locating pin protruding outward from the circumference of the coupling piece on either of the shafts to engage and

provide an axial reference position for the collar along the axis of the shafts.

4,416,564

HUB AND WEB ASSEMBLY

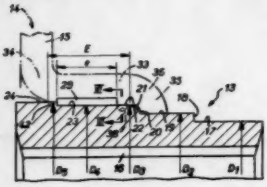
Rene Billet, Lamorlaye, and Pierre Renaud, Le Plessis-Trevise, both of France, assignors to Valeo, Paris, France

Filed Oct. 28, 1981, Ser. No. 315,975

Claims priority, application France, Oct. 31, 1980, 80 23307

Int. Cl.³ B25G *3/00*; F16B *7/18*; F16D *1/00*

U.S. Cl. 403—282 **21 Claims**



1. An assembly of two coaxial components comprising an inner component defining a cylindrical hub and an outer component including a sleeve having an axial drive fit onto said inner component, one of said components having longitudinal broaching serrations, substantially complementary serrations on the other of said components having the appearance of being formed by said broaching serrations, said broaching serrations and said complementary serrations being intermeshed, the improvement wherein said outer component has an inturned terminal end, and said inner component has a transverse shoulder, said inturned terminal end bearing axially against said transverse shoulder and positively determines the axial position of said outer component on said inner component.

4,416,565

METHOD AND COLUMN FOR COLLECTION AND SEPARATION OF OIL, GAS AND WATER FROM BLOWING WELLS AT THE SEA BED

Ole C. Ostlund, Ovre Stokkavei 21, Stavanger, Norway

PCT No. PCT/NO80/00034, § 371 Date Jul. 1, 1981, § 102(e) Date Jul. 1, 1981, PCT Pub. No. WO81/01310, PCT Pub. Date May 14, 1981

PCT Filed Oct. 31, 1980, Ser. No. 280,005

Claims priority, application Norway, Nov. 2, 1979, 793524

Int. Cl.³ E02B *15/04*

U.S. Cl. 405—60 **15 Claims**

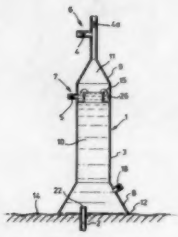
1. A balancing column for collecting and separating gas, water and oil flowing from an underwater well head, said column comprising:

(a) a vertically arranged column, said column having ballasting means for lowering said column over said well head in a vertical position, said column having a closed upper end and an open lower end for supporting said column on the sea bed;

(b) an oil accumulator in the lower and middle portion of the column for dissipating the kinetic energy of an upflowing oil-gas mixture;

(c) a gas accumulator in the upper end of the column for accumulating gas as it separates from said oil-gas mixture;

(d) first and second valve means for equalizing the hydrostatic pressure inside and outside the lower edge of the



column resting on the sea bed, said valve means regulating the accumulated oil and gas within the column to provide a positive engagement between the column and the sea bed, said first valve means discharging oil from said oil accumulator and said second valve means discharging gas from said gas accumulator at predetermined rates for said equalization;

whereby the positive engagement between the column and the sea bed is maintained to prevent a breakout of the sea bed below the column.

4,416,566

SUPPORTING APPARATUS FOR THE PROTECTION OF MINE GATE CROSSINGS

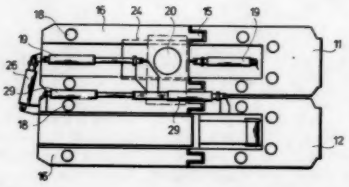
Ferenc Szebenyi; Janos Nemeth; Jozsef Bohnert, all of Budapest; Andras Solymos, Tatabanya; Miklos Petrassy, Tatabanya; Tamas Kovacs, Tatabanya; Jozsef Krupanszky, Tatabanya, and Istvan Noll, Tatabanya, all of Hungary, assignors to Tatabanyai Szenbanyak, Tatabanya, Hungary

Filed Apr. 13, 1982, Ser. No. 367,841

Claims priority, application Hungary, Apr. 13, 1981, 947/81

Int. Cl.³ E21D *23/00*

U.S. Cl. 405—291 **9 Claims**



1. In a self-advancing support apparatus for protecting mine gate crossings and for engaging the reversing/driving head of a longwall and a gate conveyor, the support apparatus having at least two side by side support units, each unit being formed as a longwall face support and a gate support coupled together by at least one connecting element and including a base, a canopy, tracing elements connected between them by articulation at least one advancing element and holding device mounted on the base, a guide track extending in the direction of a gate conveyor for advancing the reversing/driving head of a longwall conveyor and an actuating/controlling unit, the

improvement comprising: holding means for engaging the reversing/driving head of the longwall conveyor and having at least two degrees of freedom of movement, an extendible cantilever connected to each canopy and at least one means connected to the two units together for directionally guiding same.

4,416,567

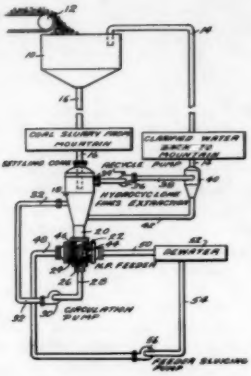
METHOD AND APPARATUS FOR TRANSPORTING MINED PARTICLES FROM AN ELEVATED SITE

Carl L. Elmore, and Erwin D. Funk, both of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Feb. 18, 1982, Ser. No. 349,817

Int. Cl.³ B65G *53/33*

U.S. Cl. 406—63 **15 Claims**



1. A method of transporting heavier than water particles from an elevated supply site to a delivery site at a substantial elevation below said elevated supply site comprising the steps of

mixing the particles at said supply site with liquid to form a slurry of particles and liquid,

introducing slurry at said supply site into a confined path extending downwardly from said supply site to said delivery site,

confining a volume of slurry material in energy transmitting relation to the slurry in said confined path such that the static head of the slurry in said confined path is transmitted to the confined volume,

continuously withdrawing material from said confined volume at spaced first and second positions and introducing liquid into said confined volume in such a way as to (1) maintain the pressure conditions within said confined volume generally equal to the static head of the slurry in said confined path minus friction losses and (2) enable slurry from said confined path to flow into said confined volume and the particles thereof to move within the confined volume such that the material at the first withdrawal position contains the larger particles of the slurry and the material at the second withdrawal position is substantially devoid of the larger particles of the slurry,

continuously separating a liquid fraction from the material withdrawn from the confined volume of said second withdrawal position in such a way that the pressure of said liquid fraction is not materially lowered with respect to the pressure of the material in said confined volume,

pumping the liquid fraction along a confined path extending upwardly to said supply site, and

utilizing the liquid fraction pumped along said upwardly extending confined path at said supply site as the liquid in said mixing step.

4,416,568

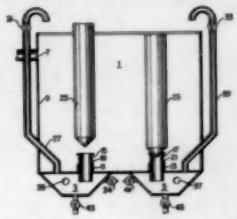
TWIN OUTLET FEED DISTRIBUTOR

Raymond L. Anderson, P.O. Box 219, Faro, Yukon, Canada K0B 1K0

Filed Feb. 25, 1982, Ser. No. 352,402

Int. Cl.³ B65G *53/30*

U.S. Cl. 406—123 **3 Claims**



1. A twin outlet feed distributor for collecting ores and slurries and distributing them for further handling and distribution consisting of a single upper chamber, at least two lower chambers immediately below said upper chamber, a valve between said upper chamber and each of said lower chambers, a pump associated with each of said lower chambers for removing ore and slurry from said lower chambers, a vent pipe from each of said lower chambers, the upper end of each of said vent pipes being directed into said upper chamber, and a high pressure water inlet into each lower chamber for flushing slurry and ore selectively from said lower chambers through said vent pipe into said upper chamber.

4,416,569

TOOL POSITION COMPENSATING MECHANISM

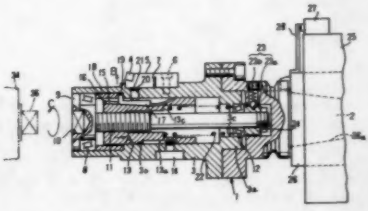
Tetsuro Yamakage, Anjoh, and Toshiharu Takashima, Chiryu, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 10, 1981, Ser. No. 253,048

Claims priority, application Japan, Apr. 30, 1980, 55-58203[U]

Int. Cl.³ B23B *25/00, 29/034*

U.S. Cl. 408—4 **7 Claims**



1. A tool holder for use on a machine tool comprising:

a shank receivable in a tool spindle of said machine tool;

a tool mounting shell integrally provided on said shank and fixedly carrying a cutting tool including a cutting blade support end, said cutting blade support end being bendable toward a radially outward direction of said tool mounting shell;

a screw shaft rotatably supported in said tool mounting shell in axial alignment with the axis of said shank and provided with first positive drive means at an outer axial end thereof;

a sleeve received in said tool mounting shell and being rotatable therewith, said sleeve being threadedly engaged with said screw shaft for being axially moved when relative

rotation between said tool mounting shell and said screw shaft is brought about, said sleeve being formed with a cam surface which is sloped along and relative to the axis of said tool shank; and

transmitting means interposed between said cutting tool and said cam surface of said sleeve for bending said cutting tool support end of said cutting tool toward said radial outward direction when moved by the wedge action of said cam surface at the time of axial movement of said sleeve;

said machine tool including:

a work table for mounting a workpiece thereon, said tool spindle and said work table being relatively movable with each other in first to third directions, said first to third directions being perpendicular to one another;

second positive drive means nonrotatably provided on said work table and engageable with said first positive drive means of said screw shaft;

feed means for effecting relative movement between said tool spindle and said work table in said first to third directions so as to bring said first positive drive means into engagement with said second positive drive means; and

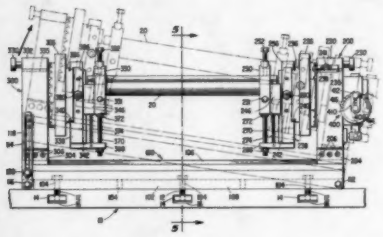
a spindle drive motor connected to said tool spindle for rotating said spindle, with said first and second positive drive means being engaged with each other, so as to effect said relative rotation between said tool mounting shell and said screw shaft.

4,416,570

PRECISION WORK HOLDER FOR MACHINE TOOLS

Carl T. Argenbright, 44 N. Spring St., Shippensburg, Pa. 17257

Continuation of Ser. No. 149,569, May 14, 1980, abandoned.
This application Oct. 14, 1982, Ser. No. 434,529
Int. Cl.³ B23Q *3/18*
U.S. Cl. 409—222 **26 Claims**



1. A work holder for precision positioning and movement of a workpiece relative to a machine tool to facilitate the formation of complex surfaces on the workpiece, the work holder comprising:

a base;

a pair of spaced stocks mounted on said base, one of said stocks being a headstock and the other of said stocks being a tailstock;

a headstock spindle assembly supported on said headstock for rotation about an axis;

drive means for effecting precisely controlled, slow rotation of said headstock spindle assembly about said axis;

a tailstock spindle assembly supported on said tailstock for free rotation about said axis;

a chuck supported on each of said spindle assemblies for firmly clamping the workpiece therebetween, said tailstock spindle assembly being rotatable by said drive means through the clamped, rotating workpiece;

adjustable mounting means on each of said spindle assemblies for permitting synchronous adjusting movement and secure positioning of said chucks relative to said spindle assemblies in two orthogonal directions transverse to said axis when the workpiece is clamped between said chucks and is manually moved for adjustment transversely of said axis; and

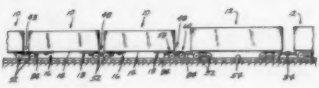
base elevating means for varying the relative heights of the two ends of said base to tilt said axis at a selected angle of inclination.

4,416,571

TRUCK AND RAIL TRANSPORTATION SYSTEM

Robert A. Krause, 3838 Rainbow Blvd., Apt. 708, Kansas City, Kans. 66103

Filed Feb. 17, 1981, Ser. No. 234,647
Int. Cl.³ B60F *1/04*; B60P *3/32*; B61D *3/12*
U.S. Cl. 410—53 **7 Claims**



1. A convertible rail and highway vehicle for use on railroad rails, and for use on highways with tractors having a fifth-wheel mechanism, said vehicle comprising:

an elongated container having a bottom exterior surface, said bottom exterior surface having first and second opposite ends and opposite lateral sides;

a first pair of spaced apart rails mounted at one of said first ends of said container floor and a second pair of spaced apart rails mounted at said second end of said container floor;

a fifth wheel carriage having a base with a fifth-wheel plate and a fifth-wheel pin and having a plurality of wheels rotatably attached to said base retentively engaging said first pair of spaced apart rails and beiang adapted to roll along said rails to permit longitudinal movement of said fifth-wheel carriage with respect to said container;

carriage locking means for locking said fifth-wheel carriage to said rails to prevent longitudinal movement thereon;

said fifth-wheel carriage having said fifth-wheel pin extending downwardly therefrom for engagement with said fifth wheel mechanism of said tractor;

a highway wheel carriage having a carriage frame, highway wheels for engaging a highway being rotatably mounted to said carriage frame, and a plurality of wheels rotatably mounted to said carriage frame adapted to retentively engage said second pair of spaced apart rails for rolling movement thereon in a longitudinal direction with respect to said container;

second locking means for locking said carriage frame to said second pair of rails to hold said carriage frame against longitudinal movement thereon;

first and second bogie engaging pins attached to said first and second ends of said container floor and extending downwardly therefrom;

a railroad bogie having a bogie frame having a longitudinal axis, a pair of wheel axles transverse to said longitudinal axis, railroad wheels rotatably mounted on the ends of said wheel axles, railroad rails for rolling movement thereon, and first and second couplers extending from opposite ends of said bogie frame,

a pair of fifth wheel mechanisms pivotally mounted on said bogie frame for pivotal movement about first and second pivotal axes which are spaced apart longitudinally on said bogie frame; and

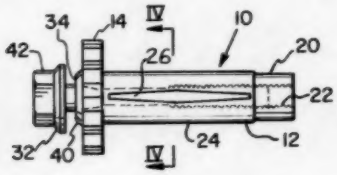
said fifth wheel mechanisms each having a receptacle sized for receiving one of said bogie engaging pins, and pin locking means being provided on said fifth wheel mechanisms for locking said bogie engaging pins in said receptacles.

4,416,572

COLLAPSIBLE FASTENER WITH PLASTIC SLEEVE

Daniel A. Black, Pleasant Hills, Pa., assignor to Textron Inc., Providence, R.I.

Filed May 18, 1981, Ser. No. 264,436
Int. Cl.³ F16B *13/04*
U.S. Cl. 411—38 4 Claims



1. In a collapsible fastener for joining workpieces wherein a tubular sleeve has a head on one end bearing against one surface of the work, an internally threaded tail and a shank extending between said sleeve ends, the shank of the sleeve including longitudinally extending slots and the resulting strips being notched internally intermediate the ends, and a screw with threads is extended through the head and the sleeve and is threaded into the tail such that by turning the screw, the tail travels toward the head and the strips are folded against the other surface of the work, the improvement comprising:

A. a compressible annulus on the opposite side of the head of the sleeve from the shank and surrounding the bore of the sleeve, said annulus being radially inwardly tapered through its periphery toward the longitudinal central axis of the tubular sleeve, said tubular sleeve and annulus being one piece;

B. the screw shank between the top of the screw threads and the head portion having a diameter approximately equal to or less than the root diameter of the screw threads and being devoid of threads; and

C. the length of the sleeve between the end opposite the sleeve head and the internal notches being less than the length of the screw shank carrying threads

such that the annulus is tightly engaged by the screw against the work to provide a seal therebetween, said screw threads, fastener length and internally threaded tail length being selected so that for a given thickness of workpieces overtorquing of the fastener is prevented by the absence of threads on the screw shank.

4,416,573

PLOW BOLT

John A. Matalis, Lombard; Richard L. Heinie, Havana, and Duane E. Wegerer, Canton, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Aug. 10, 1981, Ser. No. 291,709
Int. Cl.³ F16B *00/00*
U.S. Cl. 411—378 1 Claim

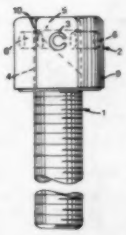
1. In a plow bolt having an elongated threaded body and a head attached coaxially to an end thereof, said head having an inverted truncated generally right circular conical periphery with diametrically opposite planar surfaces superposed thereon, the improvement wherein said planar flat surfaces of said head are disposed at substantially the same angle relative to the axis of said bolt as said circular conical periphery is disposed relative to said axis.

4,416,574

MULTIPLE PIECE BOLT-TYPE FASTENER

Jerome R. Klimowicz, 3827 W. LeGrande Blvd., 103N, Mequon, Wis. 53092

Continuation-in-part of Ser. No. 47,268, Jun. 11, 1979, Pat. No. 4,266,460. This application Dec. 19, 1980, Ser. No. 218,366
The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.
Int. Cl.³ F16B *39/04, 35/00*
U.S. Cl. 411—397 6 Claims

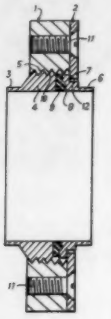


1. A bolt-type fastening unit, comprising a threaded shank having an offset end surface defining a generally inclined end surface, a cup-shaped drive head having a base wall and a threaded axial opening from the base to substantially the entrance to said axial opening, said head being threaded onto said shank and establishing a chamber within the head and the end of the shank, said head having at least three lateral and circumferentially spaced openings through the side wall spaced from the entrance to said cup-shaped head, said openings being non-parallel whereby the exterior of said three openings into said chamber intersect within said chamber establishing at least one of said openings fully communicating with said chamber, and an interlocking means fixedly extending through said opening into overlying engagement with said offset end surface to interlock the head to the shank and transmit the turning force applied to the head to the shank, said cup-shaped head having an axial depth of an essentially constant thickness at least greater than twice the axial length of said locking openings whereby the portion of the head extending from said opening onto said shank is at least equal to the portion inclusive of said opening.

4,416,575
UNION NUT

Barry McCarthy, London, England, assignor to Quinn Engineers Ltd., London, England

Filed Sep. 17, 1981, Ser. No. 302,985
Claims priority, application United Kingdom, Mar. 18, 1981, 8108419
Int. Cl.³ F16B 37/00
U.S. Cl. 411—432 14 Claims

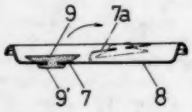


1. A union nut, for drawing axially together a first tube portion having an external thread and a second tube portion having a radially outwardly projecting flange, comprising an annular body having at least part thereof made of a synthetic resinous plastics material and provided with an internal thread to engage with the external thread of said first tube portion, and tool-engaging abutment means secured releasably on the annular body and projecting radially inwardly beyond said internal thread for abutment axially against said flange of said second tube portion.

4,416,576
METHOD OF FORMING SCORE IN CAN END PLATE AND METHOD OF ATTACHING TAB TO THE SAME FOR FACILITATING THE OPENING OF CAN

Kiyoshi Kawamata, 2-337 Takahana Cho, Ohmiya City, Saitama Prefecture, Japan

Filed Nov. 9, 1981, Ser. No. 319,878
Claims priority, application Japan, Mar. 30, 1981, 56-46847
Int. Cl.³ B21D 51/38
U.S. Cl. 413—12 3 Claims

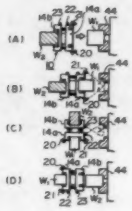


1. A method of providing a can end plate with a score and a tab for facilitating the opening, comprising the steps of: coating said can end plate with a layer of a thermoplastic resin at at least one side of said can end plate; forming a score in said can end plate through said layer of thermoplastic resin such that a tab attaching opening formed in said can end plate is surrounded by said score; fitting an attaching projection of a tab member formed of a synthetic resin in said tab attaching opening; and heating and pressing said attaching projection by a heating device to form an anchoring portion while melting, pressing and charging said thermoplastic resin into said score and also sealing the juncture between said tab and said can end plate with said thermoplastic resin.

4,416,577
ROBOT HAND OF AN INDUSTRIAL ROBOT

Hajimu Inaba, Hino, and Ryo Nihei, Musashino, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,284
Claims priority, application Japan, Aug. 6, 1980, 55/107077
Int. Cl.³ B65H 29/06
U.S. Cl. 414—226 10 Claims



1. A robot hand provided for an industrial robot which is used in association with a machine tool for carrying out a manipulating operation of attaching a workpiece to and detaching a workpiece from a workpiece holding means of the machine tool, said robot hand comprising:

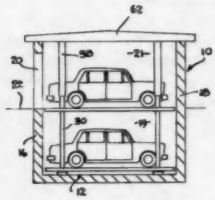
two sets of grasper means arranged side by side, each grasper means having a finger assembly for grasping a workpiece therein, and

means attached to grasper means for removing chips and other foreign materials attached to said workpiece holding means of said machine tool while said manipulating operation of said robot hand is carried out.

4,416,578
MULTI-STORY ELEVATOR-TYPE GARAGE

Hahns-Jürgen Behncke, Ringseeweg 29, Bad Wiessee, Fed. Rep. of Germany

Filed Apr. 20, 1981, Ser. No. 255,437
Int. Cl.³ E04H 6/06, 6/12
U.S. Cl. 414—249 12 Claims



10. A multi-story elevator-type garage comprising at least two vertically spaced apart vertically moveable platforms with one situated above the other, each of said platforms being shiftable to an access level, a moveable carrier operatively connected to said platforms for causing upward and downward movement of said platforms, a garage roof operatively associated with said platforms and being disposed over the uppermost of the platforms by a distance at least sufficient to accommodate a motor vehicle when the platforms are in their uppermost position, a support operatively connected to said garage roof, a column forming part of said carrier and being engageable with said support, a sliding member disposed within and engaging said column, synchromesh spindle screws connected at their upper ends to said sliding member, ball-and-socket joints which receive said spindle screws at their lower ends, a drive unit operatively connected to said carrier for shifting said carrier and the platforms therewith, said drive unit

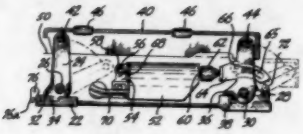
being comprised of nuts located and associated with at least one of said platforms, said synchromesh spindle screws being operative with said nuts and being rotated with respect to said nuts for causing said platforms to move upwardly and downwardly through rotary motion of said spindle screws, a drive motor associated with said drive unit, and a drive element operatively connected to said spindle screws and drive motor for causing rotation of said spindle screws.

4,416,579

POWER-ACTUATED LOW PROFILE CARGO GUIDE

John Alberti, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 29, 1981, Ser. No. 278,478
Int. Cl.³ B60P 1/64; B63B 25/22
U.S. Cl. 414—534 8 Claims



1. A cargo guide assembly for restraining movement of cargo in a cargo hold comprising:

a base;

a guide rail;

first means for mounting said guide rail to said base for movement of said guide rail between a first position in which said guide rail engages and restrains the movement of said cargo and a second position in which said guide rail is out of restraining engagement with said cargo, said first means including a first mounting pawl pivotally mounted on said base for swinging movement between an erect position in which said first mounting pawl is substantially orthogonal to said base and a retracted position in which said first mounting pawl is substantially oblique to said base, a second mounting pawl having an actuation pin formed thereon, said second mounting pawl being pivotally mounted on said base for swinging movement between an erect position in which said second mounting pawl is substantially orthogonal to said base and a retracted position in which said second mounting pawl is substantially oblique to said base, said guide rail being pivotally mounted at a first end to said first mounting pawl and at a second end to said second mounting pawl, said first and second mounting pawls being held in substantially parallel relation by said guide rail such that said first and second mounting pawls move in unison, said guide rail being in its first position when said first and second mounting pawls are in their respective erect positions and said guide rail being in its second position when said first and second mounting pawls are in their respective retracted positions;

actuator means mounted on said base, said actuator means being operable from a remote location to move said guide rail from its first position toward its second position, said actuator means including an actuator body and an extensible rod mounted within said actuator body, said extensible rod being operable for extension from said actuator body and retraction into said actuator body;

actuator linkage means affixed to said extensible rod and connecting said actuator means to said second mounting pawl so that operation of said actuator means to extend and retract said extensible rod moves said second mounting pawl between its erect and retracted positions, said linkage means including an actuation link affixed to said extensible rod, said actuation link having an elongate slot formed therein, said actuation pin of said second pawl engaging a first end of said slot when said second mounting pawl is in its erect position, and said actuation link exerting a force on said actuation pin through the surface defining said first end of said slot to move said second pawl toward its retracted position; and

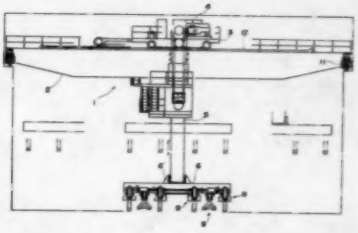
first biasing means associated with said base and said guide rail for biasing said guide rail toward its cargo-restraining position.

4,416,580

CLAW CRANE WITH PUSHERS

Yukio Haga; Tomeo Kai; Akira Shirayama, and Gengi Kanatani, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1980, Ser. No. 179,643
Claims priority, application Japan, Aug. 30, 1979, 54-109647
Int. Cl.³ B66C 1/42
U.S. Cl. 414—626 7 Claims



1. A pusher equipped claw crane comprising:

a mast suspended from crane hoist means so as to be moved vertically;

a main beam pivotably coupled to the lower end of said mast;

a plurality of sub-beams arranged on the lower part of said main beam to cross the same at right angles;

a plurality of claw shifter means suspended from the lower part of two of said sub-beams to be moved in the axial direction thereof;

pusher means arranged between two adjacent claw shifter means and suspended from the lower part of one of said sub-beams to be moved in the axial direction thereof;

means for moving said claw shifter means and for moving said pusher means with respect to said sub-beams; and

tilting means attached to an intermediate part of said mast for controlling tilting movement of said sub-beams.

4,416,581

METHOD AND APPARATUS FOR COOLING AN EXPANDER

Carl H. Geary, Jr., Greensburg, Pa., assignor to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Feb. 16, 1982, Ser. No. 349,402
Int. Cl.³ F01D 5/18
U.S. Cl. 415—1 8 Claims

1. A method for providing thermal protection to a hot gas expander having solid vanes including the steps of:

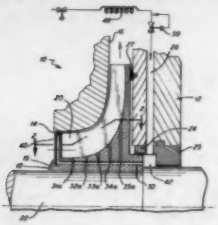
rotating the expansion wheel of a hot gas expander by passing hot gas therethrough;

supplying a cooling media to the inlet end of each vane of the rotating expansion wheel;

distributing the cooling media in the direction of hot gas flow over the inlet end of each vane of the expansion wheel for essentially the full height of the vane;

supplying the cooling media to the base of the pressure side of each vane at least over the inducer portion of each vane; and

distributing the cooling media over the pressure side of each vane at least over the inducer portion whereby film cooling of the hot gas expander is achieved with minimal cooling of the hot gas.

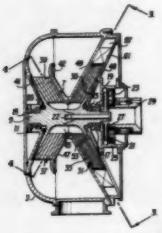


4,416,582

MULTI-STAGE TURBINE ROTOR

Benjamin G. Glass, 3011 Stockett Way, San Diego, Calif. 92117

Filed Sep. 22, 1980, Ser. No. 188,987
Int. Cl.³ F01D *1/36, 17/14*
U.S. Cl. 415—59 **11 Claims**



1. A multi-stage turbine for geothermal application which is driven by a fluid such as steam or a similar gas and which comprises a casing and a rotor on a shaft journalled for rotation in said casing, said rotor comprising two adjacent disc packs mounted in tandem on said shaft, the first of said packs being a circular fluid inflow pack with an outer circumference having fluid inlet means, at least one inlet for the introduction of fluid under pressure into said casing, an internal nozzle mounted in said casing for communicating and controlling the flow of fluid from said inlet to said inlet means and through said inflow pack to drive said shaft, the second of said packs comprising spaced apart conically configured discs having an outer circumference with fluid outlet means, the discs of each pack having central openings which define a common fluid passageway within said rotor and said passageway being located adjacent said shaft to provide direct communication for fluid discharged from the interior of said inflow pack to be received by the interior of said outflow pack and to flow through said outflow pack to drive said shaft before the fluid exits from said outflow means at the outer circumference of said second pack.

4,416,583

CENTRIFUGAL VAPOR COMPRESSOR

Edson H. Byrns, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

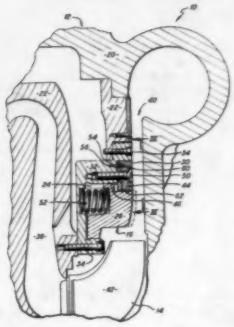
Continuation of Ser. No. 137,173, Apr. 4, 1980, abandoned. This application Jul. 2, 1982, Ser. No. 394,748
Int. Cl.³ F04D *27/00*
U.S. Cl. 415—148 **2 Claims**

1. A centrifugal vapor compressor comprising:

a housing defining an inlet passage, a diffuser passage, and a diffuser valve recess extending from the diffuser passage;

an impeller rotatably mounted in said housing on an axially extending shaft and including a radially extending impeller blade;

an annular diffuser valve extending around the impeller blade and supported by the housing for axial movement within the diffuser valve recess and the diffuser passage between minimum and maximum throttling positions, said annular diffuser valve having an outside annular face facing the diffuser passage, at least one axially extending, radially projecting face extending radially outward from said outside annular face, and a flange radially extending from each of said axially extending, radially projecting



faces, each of said flanges having a radially extending surface facing the diffuser passage;

stop members mounted on the housing in the diffuser passage portion of the housing, each of said stop members having a surface facing the diffuser passage which is coplanar with the walls of the diffuser passage and each of said stop members positioned for engagement with one of the axially extending, radially projecting faces of the diffuser valve to limit movement of the diffuser valve circumferentially about its axis and positioned for engagement with the radially extending surface of each of the flanges of the diffuser valve to limit axial movement of the diffuser valve at the maximum throttling position; and

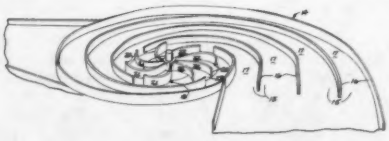
fastening means for disengagably securing each of the stop members to the housing.

4,416,584

AMBIENT PRESSURE WATER TURBINE

Peter E. Norquest, P.O. Box 5501, Boise, Id. 83705

Filed Aug. 28, 1980, Ser. No. 182,109
Int. Cl.³ F01D *1/08*
U.S. Cl. 415—184 **7 Claims**



1. An ambient pressure water turbine for use in conjunction with a low total energy supply of water, comprising:

runner means for receiving water exposed to ambient atmospheric pressure, said runner means being mounted for rotational movement about a central vertical axis;

a plurality of vanes fixed about said runner at equally spaced locations about said central vertical axis, each vane ex-

tending outward relative to said central vertical axis from an inner vane end to an outer vane end, each vane having an upright rear face extending between its ends, and further being provided with an oppositely directed front face;

runner floor means located directly beneath the vanes for elevationally supporting water flowing along each vane;

water discharge means positioned beneath said runner in open hydraulic communication with the inner vane ends for freely receiving water from the inner vane ends;

and infeed means operably interposed between the supply of water and the runner periphery, said infeed means comprising a series of spiral chutes for conveying water under ambient atmospheric pressure in hydraulic communication with the supply of water and leading toward inner chute ends circumferentially spaced about and radially adjacent to the runner periphery, each chute having both progressively lowered elevation and progressively reduced width in the direction of the water flow for increasing the water velocity to the maximum obtainable value for the flowing depth of water being delivered to the runner and for directing the water onto the runner floor means at a flow rate and angle relative to the runner periphery such that the water enters the runner in a supercritical flow condition and is maintained in such condition as it traverses the runner floor means while in contact with the rear faces of the respective vanes, the minimum slope of the ambient atmospheric pressure chutes being sufficient to prevent the water from attaining uniform flow prior to reaching the runner periphery.

4,416,585

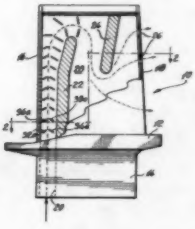
BLADE COOLING FOR GAS TURBINE ENGINE

William Abdel-Messeh, Beloeil, Canada, assignor to Pratt & Whitney Aircraft of Canada Limited, Longueuil, Canada

Continuation-in-part of Ser. No. 112,745, Jan. 17, 1980, abandoned. This application Aug. 12, 1981, Ser. No. 292,249

Int. Cl.³ F01D *5/08*

U.S. Cl. 416—97 R **11 Claims**



1. A blade for use in a gas turbine engine comprising hollow passageways in the blade for passing a coolant therethrough in a direction parallel to the axis of the passageway, the passageway including opposed walls, at least one of the walls having longitudinally spaced-apart pairs of ridges formed on said wall, each ridge in a pair being spaced apart to form a gap and defining an angle θ therebetween and each ridge defining an angle ϕ to the axis of the passageway, and wherein:

$$\theta = 2\phi \cong \pi/2;$$

each ridge having a height E and the passageway having a width H between the opposed walls wherein the ratio E/H is within the range of 0.04 and 0.333.

4,416,586

SUBMERSIBLE MOTOR PUMP ASSEMBLY

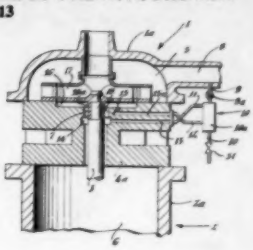
Herbert Diederich, Frankenthal; Karl Gaffal, Hessheim, and Hugo Scherzer, Heidelberg-Rohrbach, all of Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany

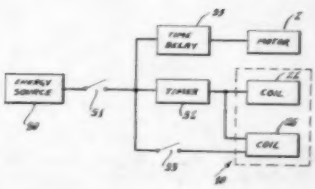
Filed Apr. 9, 1981, Ser. No. 252,584

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1980, 3015211

Int. Cl.³ F04B *49/10*; **F03B** *11/00*

U.S. Cl. 417—13 **18 Claims**





1. A submersible motor pump assembly for circulation of a liquid which contains magnetizable solid impurities, comprising a pump having a casing with discharge means for pressurized liquid; a motor having a housing and including a rotary shaft arranged to drive said pump; a device defining with said shaft a clearance communicatively connecting the interior of said casing with the interior of said housing; and apparatus for preventing penetration of impurities from said casing into said housing via said clearance, including liquid conveying means defining a path for the flow of at least one stream of liquid from said discharge means into said clearance, and filter means provided in said path to intercept impurities in the stream of liquid entering said path so that said conveying means delivers to said clearance a stream of flushing liquid which is at least substantially free of impurities, said filter means comprising a magnetically operated filter adapted to attract and thus intercept magnetizable impurities in said path, and said magnetically operated filter including a container, and a plurality of electromagnets in said container, said electromagnets defining a series of passages for the flow of liquid from said discharge means toward said clearance so that each of said electromagnets can attract some magnetizable impurities during flow of liquid through the respective passage.

4,416,587

HEAT OPERATED PUMP

John M. Tribey, Bayswater, Australia, assignor to Malz Nominees Pty. Ltd., Caulfield, Australia

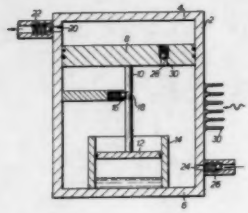
Division of Ser. No. 940,765, Sep. 8, 1978, abandoned. This application Jul. 11, 1980, Ser. No. 168,770

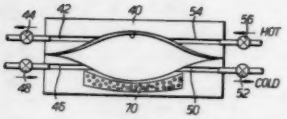
Int. Cl.³ F04B *19/24*

U.S. Cl. 417—52 **3 Claims**

1. A transducer for converting heat energy of a fluid into kinetic energy, said transducer comprising:

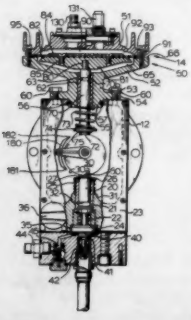
(a) cylinder means and at least one piston slidably mounted therein;
(b) a volatile fluid contained within the cylinder means;
(c) a pump, said pump including a pump chamber, a pumping element movable therein, inlet and outlet means for admitting and discharging said fluid from the pumping chamber, said piston and said cylinder means being located within said pump chamber whereby said piston is connected to said pump;





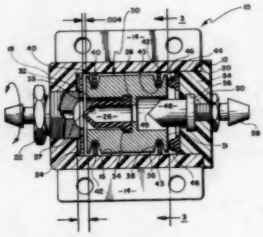
(d) non-linear restraining means which acts on said piston and is operable to hold said at least one piston in a first stable position
(e) means to apply heat energy to said volatile fluid,
whereupon said volatile fluid evaporates to exert increased pressure on said at least one piston sufficient to overcome said restraining means, and said at least one piston moves to a second stable position at which the restraining force applied to said at least one piston by said non-linear restraining means is less than at said first stable position.

4,416,588
AIR COMPRESSOR FOR PAINT PUMPS
Rudolf Karliner, Minnetonka, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Mich.
Filed Jul. 18, 1980, Ser. No. 169,955
Int. Cl.³ F04B *41/06*
U.S. Cl. 417—199 R **12 Claims**



1. In an airless liquid coating spray pump having a reservoir housing with a pump drive power transmitting means received in the housing, a liquid coating pump piston extending through a wall of the housing having an end within the housing engaging the power transmitting means, and a liquid coating pumping chamber exterior of the housing operatively acted upon by reciprocation of the piston, the improvement of a bore through a wall of the housing, a second piston received in the bore having an end in the housing in engagement with the power transmitting means, a gas compressor exterior of the housing, and a second end of the second piston operatively associated with the gas compressor, each of the pistons being reciprocated by engagement with the power transmitting member, and the reciprocation of each piston being effective to operate the associated liquid coating pump and compressor to compress gas by the gas compressor and to pressurize liquid coating by the liquid coating pump, and means for disengaging one of the pistons from engagement with the power transmitting means, said means for disengaging effective to de-activate one of the liquid coating pump and compressor upon disengagement of one of the pistons from engagement with power transmitting means, said means being selectively actuatable to provide selected operation in each of three modes, a first of said modes simultaneously operating said liquid coating pump and said gas compressor, a second of said modes operating only said gas compressor, and a third of said modes operating only said liquid coating pump.

4,416,589
VIBRATION ACTUATED LIQUID PUMP
John C. Perry, 3170 Falcon Dr., Carlsbad, Calif. 92008
Filed Sep. 18, 1981, Ser. No. 303,216
Int. Cl.³ F04B *17/00, 35/00, 21/04*
U.S. Cl. 417—211 **5 Claims**



1. A pump for pumping fluids comprising:
an elongated body forming a first fluid inlet end and a second fluid exit end, said body further defining a cylindrical bore therethrough,
a free-moving piston weight mass having a first pumping end and a second suction end is suspended within said cylindrical bore by resilient means positioned between the weight mass and the cylindrical bore, said piston forming a passageway therethrough, said resilient means is two substantially radially disposed resilient rings suspending said piston in said cylindrical bore, a first resilient ring being retained in a circumferential groove formed in said piston and positioned near said first pumping end of said piston weight mass, a second resilient ring being retained in a groove formed in said piston and positioned near said second suction end of said piston, the outer peripheral edge of the resilient rings do not move axially relative to the piston weight means suspended in the cylindrical bore by the rings, said piston weight mass, when positioned approximately halfway within said cylindrical bore defines a first fluid inlet chamber formed between said second suction end of said piston, an inner wall of said cylindrical bore formed by said body and said first inlet end, a second fluid reservoir chamber being formed between said first pumping end of said piston, said inner wall of said cylindrical bore and said second fluid exit end, said first fluid inlet chamber and said second fluid reservoir cham-

ber varying in volume as the weight mass moves axially within said cylindrical bore,

a source of fluid directed to said first fluid inlet end,

a first one-way valve means secured to said body in fluid communication with said first fluid inlet end,

a second one-way valve means secured to said piston weight mass in fluid communication with said passageway formed by said piston weight mass, said second valve means is closed when said piston moves within said cylindrical bore toward said second fluid exit end thereby forcing any fluid within said second fluid reservoir chamber out of said exit end, said first one-way valve means communicating with said first fluid inlet end opens substantially simultaneously as said piston moves toward said fluid exit end drawing fluid through said first fluid inlet end from said source of fluid substantially filling said first fluid inlet chamber, as said piston weight mass reverses direction at the end of its stroke, said one-way valve means in communication with said first fluid inlet end being closed and the valve means in communication with said piston weight mass is opened thus transferring fluid into said reservoir chamber thereby completing one cycle of said pump, and

vibration means positioned substantially adjacent said elongated body, oscillatory motion, upon operation of said vibration means, serves to move said suspended weight mass axially to and fro within said body to pump fluid therethrough from said fluid source.

4,416,590

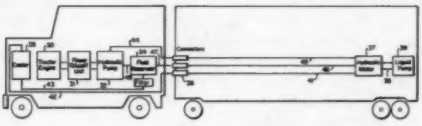
HYDRAULIC DRIVE LIQUID TRANSFER PUMP SYSTEM

Eugene C. Colucci, Niagara Falls, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 8, 1981, Ser. No. 223,436

Int. Cl.³ F04B *9/08, 17/00;* **F17C** *7/02*

U.S. Cl. 417—231 **7 Claims**



1. In a hydraulic drive liquid transfer pump system comprising:

(1) a tractor having an internal combustion engine, an air reservoir, air brakes with cylinder and a source of electric power,

(2) a power takeoff unit connected to said internal combustion engine having a power takeoff cylinder having an engage port and a disengage port,

(3) hydraulic pump means mounted on the tractor and connected to said power takeoff means,

(4) a fluid reservoir communicating with said hydraulic pump means,

(5) a trailer,

(6) hydraulic motor means mounted on said trailer,

(7) hydraulic fluid line means intercoupled between said hydraulic pump and said hydraulic motor means, said hydraulic fluid line means carrying a hydraulic fluid,

(8) liquid pump means driven by the hydraulic motor means,

(9) filter means located within said hydraulic fluid line means, the improvement consisting of a control system connected to said tractor air reservoir and said power takeoff unit comprising:

(a) means to sense the temperature of said hydraulic fluid, said means connected to said source of electric power,

(b) means to sense the pressure differential of said hydraulic fluid across said filter means, said means connected to said source of electric power,

(c) means to sense the hydraulic fluid level in said fluid reservoir, said means connected to said source of electric power,

(d) a manually operated parking control valve in communication by means of pneumatic conduit with the tractor air reservoir, the air brake cylinder, the disengage port of the power takeoff unit, an air operated inversion valve, a manually operated pumping control valve, and an air operated power takeoff valve,

(e) said air operated inversion valve in communication by means of pneumatic conduit also with the tractor air reservoir, the manually operated pumping control valve, the air operated power takeoff valve, and a solenoid operated valve,

(f) said manually operated pumping control valve in communication by means of pneumatic conduit also with the air operated power takeoff valve,

(g) said air operated power takeoff valve in communication by means of pneumatic conduit also with the engage port and the disengge port of the power takeoff unit,

(h) said solenoid operated valve in communication by pneumatic conduit means also with said power takeoff valve and by electric connection means to said temperature sensor means, said pressure differential sensor means and said liquid level sensor means.

4,416,591

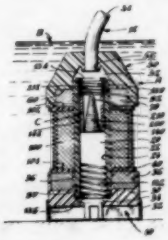
RECIPROCAL PUMP WITH IMPROVED VALVE

E. Robert Horwinski, Cheshire, Conn., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Aug. 4, 1981, Ser. No. 289,862

Int. Cl.³ F04F *7/00;* **F04B** *17/04, 21/04*

U.S. Cl. 417—241 **53 Claims**



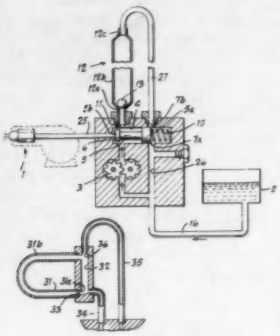
1. A valve member for a pump of the type having a liquid filled passage including a liquid inlet, a liquid outlet and an interconnecting valve chamber wherein said valve member is movable in a first direction from said inlet to said outlet and in a second direction from said outlet to said inlet, said valve member including a valve carried thereon and closed when said member is moving in said first direction and opened when said member is moving in said second direction, said valve having an elongated, generally hollow body extending axially and having a central cavity, a cap portion closing said cavity, a base portion exposing said cavity and a valving portion between said cap portion and base portion, said valving portion being a coil spring formed into normally abutting convolutions with ever-increasing external diameters in a direction from said cap toward said base and with a spring contant which allows said convolutions to separate as said valve member is driven in said second direction.

4,416,592

LIQUID FLOW CONTROL APPARATUS

Herbert E. Lindtveit, Centerport, N.Y., assignor to Sid Harvey, Inc., Valley Stream, N.Y.

Filed Apr. 15, 1981, Ser. No. 254,469
Int. Cl.³ F04B 49/04, 49/08
U.S. Cl. 417—290 1 Claim



1. Apparatus for controlling the flow of a liquid from a source (3) to a sump (26) so as to permit the flow for a predetermined time and then to terminate the flow, comprising:

a. conduit means (31,32,35 or 41,32,35) having an inlet end (34) adapted for connection to the source and an outlet end (35) adapted for connection to the sump, said conduit means including an elongated large diameter section (31,32 or 41,32) between two small diameter sections (34,35); and

b. a valve member (33) captured in the large diameter section and having a diameter smaller than the diameter of the large diameter section and greater than the diameter of the small diameter sections; said valve member being small as compared to the length of the large diameter section, said valve member being biased toward the inlet end of said large diameter section and reposing adjacent said inlet end in the absence of flow through the conduit means, and being movable toward the outlet end by the flow of liquid, said valve member being moved to engage said outlet end by a flow of liquid through the conduit means for a substantial time determined by the relative dimensions of the valve member and the large diameter section, said valve member being effective upon engagement with said outlet end to block the flow of liquid through the conduit means;

c. said large diameter section comprising first and second conduits extending between the inlet end and the outlet end, said first conduit being relatively long and having a portion extending downwardly in the direction of flow adjacent said inlet end, followed by a portion extending from the lower end of said downwardly extending portion to a locality adjacent said outlet end;

d. said second conduit being relatively short and extending continuously upwardly; and

e. said valve member is biased by gravity to said lower end, and is moved through said first conduit toward said outlet end by the flow of liquid from said source, and returns by gravity to said lower end through said second conduit when the flow ceases.

4,416,593

GAS OPERATED DOWN HOLE PUMP

Leslie L. Cummings, 4018 W. Alabama, Houston, Tex. 77027

Filed Aug. 22, 1980, Ser. No. 180,426
Int. Cl.³ F04B 47/08
U.S. Cl. 417—344 14 Claims

1. A double acting, gas operated pump for lifting formation fluid from a well, comprising a housing connectible to the lower end of a production string suspended within the well, means forming upper and lower pump chambers within the housing, a piston sealably slidable in each chamber, the lower chamber on one side of the piston therein connecting with the lower end of the housing and the upper chamber on one side of the piston therein connecting with the upper end of the housing whereby each receives formation fluid from the well, and each chamber on the other side of the piston therein connecting with the upper end of the housing to deliver formation fluid into the production string, valve means controlling the flow of formation fluid into and out of each pump chamber in order to prevent such fluid from being pumped therefrom as it is being supplied thereto and prevent such fluid from being pumped therefrom as it is being supplied thereto and prevent such fluid from being supplied thereto as it is being pumped therefrom, means including a reversing valve having a spool for supplying gas from a remote source to the first chamber on the other side of the piston therein while exhausting gas from the second chamber on the other side of the piston therein to a zone of relatively low pressure outside the production string, when the spool is in a first position, and for supplying gas from the remote source to the second chamber on said other side of the piston therein while exhausting gas from the first chamber on the other side of the piston therein to said zone of relatively low pressure when the spool is in a second position, whereby said pistons are caused to reciprocate in order to pump formation fluid from one chamber while the other chamber is being filled therewith, means for shifting said spool between its first and second positions in response to reciprocation of said piston, including a rod connected to the spool and extending through the piston, and means including spring means in which energy is stored and then released to shift the spool into each of its positions with a snap action as the piston moves into each of its opposite positions, the other piston being free of the rod.

4,416,594

HORIZONTAL TYPE VIBRATING COMPRESSOR

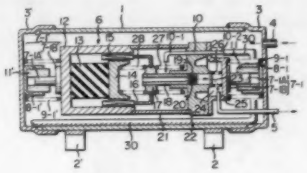
Kaoru Ichikawa, Shiraoka, Japan, assignor to Sawafuji Electric Company, Ltd., Japan

Filed Aug. 12, 1980, Ser. No. 177,591

Claims priority, application Japan, Aug. 17, 1979, 54-113615[U]; Apr. 9, 1980, 55-48041[U]

Int. Cl.³ F04B 21/00

U.S. Cl. 417—360 2 Claims



1. In a horizontal type vibrating compressor having a cylindrical container defining a chamber and having a horizontally extending axis for accommodating a compressor unit having a horizontally extending axis, the container having a pair of closure members closing opposite axial ends of the container, each closure member spaced outwardly of opposite axial ends of the compressor unit, the container adapted to receive a lubricant therein adjacent the bottom of the chamber, the compressor unit defining a compressor chamber and including a horizontally extending pumping cylinder and a horizontally extending and movable pumping piston inserted into the pumping cylinder at a location of the compressor chamber, the compressor unit including a magnet and a coil adapted to be energized for vibrating movement with respect to the magnet to move the pumping piston horizontally, an improvement comprising:

a sleeve-shaped cushioning member defining a cylindrical space and made of cushioning material connected to one of an inner surface of one closure member and a spacing opposite axial end of the compressor unit, said cushioning member disposed coaxially with the compressor unit axis;

a pin-shaped supporting member connected to the other of the closure member inner surface and facing opposite axial end of the compressor unit, said pin-shaped supporting member extending coaxially with the compressor unit axis and received for horizontal movement in said cylindrical space of said cushioning member;

a pre-compressed spring engaged between the closure member inner surface and the facing opposite axial end of the compressor unit whereby relative axial movement between the compressor unit and the container are restricted by a biasing force of said precompressed spring and an engagement between said pin-shaped supporting member and said cushioning member; and

an air-oil mixture supplying conduit connected between a bottom of said container chamber and a top of said compressor chamber, said conduit made at least in part of braided fibers in said container chamber for admitting an air/mixture into said conduit through said braided fibers and having an end disposed above the portion of the compressor chamber where the pumping piston is inserted into the pumping cylinder.

4,416,595

MINIATURE ROTARY INFUSION PUMP WITH SLIDE LATCH AND DETACHABLE POWER SOURCE

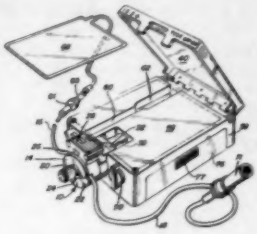
Harry W. Cromie, Pittsburgh, Pa., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 13, 1981, Ser. No. 243,540

Int. Cl.³ F04B 43/12

U.S. Cl. 417—476 5 Claims

1. In a pressure pump for fluids through flexible tubing which comprises a pressure member of generally circular periphery, means for moving said pressure member in orbital motion about an axis of rotation, and a sleeve member positioned about said pressure member and spaced for receiving and retaining the flexible tubing in a predetermined position between the pressure member and the sleeve member with the tubing surrounding said pressure member, the sleeve member being divided into a pair of substantially semi-circular jaws attached together at one end in hinged relation to permit opening and closing of the jaws about the pressure member to facilitate installation of the tubing, the improvement comprising, in combination:



said jaws each defining grippable means comprising outwardly projecting tab members adjacent their ends opposite said one end, and sliding gripper means carried in sliding slot means defined in said pressure pump, said sliding gripper means defining a slot to receive said tab members in abutting relationship and carried by said pump, said gripper means being capable of gripping the opposite ends of the jaws and retaining them together in closed relation in a first sliding position and releasing said jaws to permit them to open in a second sliding position.

4,416,596

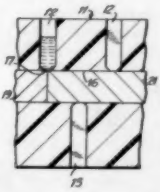
FLUID-TRANSFER SYSTEM AND METHOD

Eric S. Lichtenstein, 420 Taconic Rd., Greenwich, Conn. 06830

Filed Apr. 9, 1981, Ser. No. 252,706

Int. Cl.³ F04B 7/04

U.S. Cl. 417—488 23 Claims



1. A fluid-transfer system comprising a barrel having an axis and having first and second open ends, first and second pistons fittingly received in said first and second open ends, respectively, said pistons having opposed closed ends within said barrel, said barrel having at least one first opening for transfer of fluid into said barrel as the said interior ends of said pistons are moved apart with the space formed therebetween in registry with said first opening and at least one second opening spaced apart from said first opening along said axis of said barrel for transfer of said fluid out of said barrel when said interior ends are moved toward each other when the space therebetween is in registry with said second opening, said interior ends being shaped for fitting each other for expelling substantially all fluid therebetween, said barrel including a third opening therein for transfer of another fluid into said barrel, first and second reservoirs for holding at least a first and second fluid, respectively, connecting with said first and third

opening, respectively for delivery of fluid therethrough and at least one chamber connected with said at least one second opening for receiving fluid therethrough, said reservoirs and barrel being of a molded synthetic resin forming a module, whereby appropriate scheduling of the positioning of said pistons in said barrel makes it possible to draw a selected quantity of said first fluid into said barrel and to transfer same into said chamber and to draw a selected quantity of said second fluid into said barrel and to transfer same into said chamber.

4,416,597

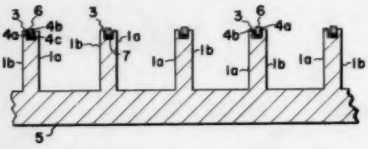
TIP SEAL BACK-UP MEMBER FOR USE IN FLUID APPARATUS OF THE SCROLL TYPE

David H. Eber, and Arthur L. Butterworth, both of La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.

Continuation of Ser. No. 232,528, Feb. 9, 1981, abandoned. This application Mar. 24, 1983, Ser. No. 478,396

Int. Cl.³ F01C *1/02, 19/08;* **F16J** *15/16;* **F16F** *1/08*

U.S. Cl. 418—55 **6 Claims**



1. A wrap element with tip seal and back-up member for use in fluid apparatus of the scroll type comprising

a. a wrap element defining at least a first flank surface of generally spiroidal configuration about a reference axis, said flank surface extending generally in an axial direction and terminating in a tip surface lying in a plane substantially perpendicular to said reference axis;

b,. a groove disposed within said tip surface of spiroidal configuration generally conforming to that of said flank surface, said groove including at least a radially outer lateral wall and a bottom wall;

c. a tip seal disposed at least partially within said groove and extending longitudinally about the spiroidal configuration thereof; and

d. a back-up member comprising a strip of material disposed within said groove between its bottom wall and said tip seal and extending longitudinally about the spiroidal configuration of the groove, said strip of material having a preformed configuration such that its radially inner edge portion engages the tip seal and is disposed axially toward the tip surface of said wrap element with respect to the radially outer edge portion thereof, which outer edge portion engages a wall of the groove, and said strip of material being constructed of an elastic material such that as said radially inner edge portion is displaced toward the bottom wall of the groove and relative to the radially outer edge portion, an opposing spring force is developed in order to provide a seal and prevent fluid from leaking under the tip seal.

4,416,598

ROTARY VANE PUMP WITH PRESSURE BIASED FLOW DIRECTING END PLATE

Johann Merz, Bopfingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

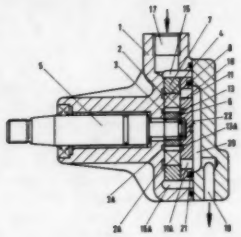
Filed Apr. 28, 1981, Ser. No. 258,413

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018649

Int. Cl.³ F04C *2/00, 15/00*

U.S. Cl. 418—132 **4 Claims**

1. In a rotary vane pump including a housing (1) enclosing a suction chamber (15, 15A) and an outlet chamber (20) from which fluid is discharged under a pump pressure, a cam ring (7) mounted in the housing and having an outer peripheral portion, a rotor (6) mounted within the housing and formed with slots extending radially outward from inner ends relative to a rotor axis, a plurality of vanes (8) slidable within said slots and engageable with the cam ring to form variable volume vane chambers, and flow control surface means (4, 10) fixed to the housing on opposite axial sides of the rotor for conducting fluid from the suction chamber to the vane chambers and from the vane chambers to the outlet chamber, including a flow directing plate (10) having an upstream side confronting the rotor, a downstream side confronting the outlet chamber, circumferentially spaced suction passages (12, 12A) in fluid communication with the suction chamber, and outlet passages (11, 11A) in fluid communication with the outlet chamber, the



improvement comprising seal means (21) on the flow directing plate limiting exposure of the downstream side thereof to the pump pressure within a predetermined pressure area (22) thereon having a radially outer chordal portion bordering the peripheral portion of the cam ring in spaced relation to the suction passages, and a radially inner constricted portion spaced radially inwardly of said suction passages and the inner ends of those of the vane slots aligned with the suction passages during rotation of the rotor about the rotor axis for exerting pressure forces on the downstream side of the flow directing plate unbalanced on the upstream side within a radially inner zone through which the rotor axis extends, whereby clearances between the plate and the rotor are reduced by bending of the plate with maximum flexure within said radially inner zone.

4,416,599

DIAPHRAGM PUMP WITH COMPENSATION MEANS IN THE HYDRAULIC CONTROL CHAMBER

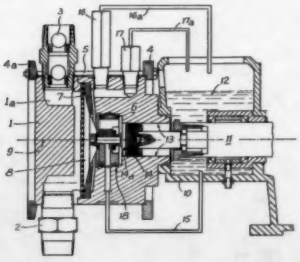
Jacques H. De Longchamp, La Chatre, France, assignor to Dosapro Milton Roy, Point Saint Pierre, France

Filed Oct. 14, 1981, Ser. No. 311,256

Claims priority, application France, Oct. 17, 1980, 80 22242

Int. Cl.³ F04B *43/02*

U.S. Cl. 417—386 **5 Claims**



1. Hydraulically controlled diaphragm pump, comprising a

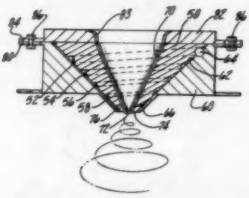
pumping chamber of variable volume of which one wall is constituted by a deformable diaphragm, an intermediate chamber filled with fluid, defined by a fixed enclosure of which one longitudinal end wall is constituted by the said diaphragm whereas another wall is constituted by a piston mounted for sliding inside the said enclosure and adapted to be actuated with a reciprocating movement inside the said enclosure, of pre-determined stroke and frequency, adjustable in relation to the rate of flow required for the pump, a conduit for re-filling the said intermediate chamber connected to a reservoir of fluid, and a controlled member for opening and closing said conduit; according to one of the main features of the invention, the said controlled member is constituted by a valve which cooperates with a fixed seat through which the said conduit reaches into the said intermediate chamber, and which is mounted for sliding on a mobile train comprising a slide rod for said valve, said rod being also mounted for sliding longitudinally inside a support integral with the enclosure of the said intermediate chamber and traversing the said seat, a shoulder integral with the said rod forming a priming means for the valve and a means to hold it on its seat, and an actuating surface integral with the said rod and situated opposite to the said shoulder with respect to the said seat, on which surface the diaphragm can rest in its back position, the said mobile train being returned towards the said membrane in its conduit-closing position, by way of a spring coupled between the said support and the said mobile train, wherein the said rod traverses the said seat, the said element being constituted by an end shoulder of the rod.

4,416,600

APPARATUS FOR PRODUCING HIGH PURITY METAL POWDERS

Chester J. Lecznar, Warren, Mich., and Griff E. Williams, Salt Lake City, Utah, assignors to Griff Williams Co., Salt Lake City, Utah and Ryan Metal Powder Technologies, Inc., Warren, Mich.

Filed Feb. 10, 1982, Ser. No. 347,409
Int. Cl.³ B01J 2/02
U.S. Cl. 425—7 **10 Claims**



1. In an apparatus for producing metal powders, said apparatus including a source of atomization fluid, an atomization unit with a nozzle therein through which molten metal is poured and contacted with the fluid at an exit of the nozzle to atomize the metal into particles, and a tank particles as they fall from the unit to an opening in bottom portions of the tank where the particles may be collected;

the improvement comprising:

an interchangeable insert having a spiral channel of decreasing cross-sectional dimension formed therein, a receptacle for the insert, said channel cooperating with the receptacle to define a spiral duct of decreasing cross-sectional dimension from an inlet coupled to the source of atomization fluid to an outlet adjacent the exit of the nozzle, said duct being adapted to generate from said fluid source a rotating fluid of a given velocity at the outlet of the duct for atomizing the molten metal into preselected particle sizes, whereby inserts with different channel configurations may be used to produce powders of different particle sizes.

4,416,601

CONTINUOUS VULCANIZER

Masakazu Hasegawa, Tokyo; Michio Takaoka, Chiba; Hiroto Oshima, Oimachi, and Keiichiro Kataoka, Urawa, all of Japan, assignors to Fujikura Cable Works, Ltd., Japan

Filed Nov. 19, 1981, Ser. No. 322,764
Claims priority, application Japan, Jun. 10, 1981, 56-89358
Int. Cl.³ B29H 5/28
U.S. Cl. 425—68 **4 Claims**

1. A continuous vulcanizer for continuously curing a covering material on a conductor which comprises:

(a) a feed means for feeding the conductor in one direction at a constant speed;

(b) an extruder for applying the covering material to the conductor delivered from said feed means to form a cable;

(c) a vulcanizing tube extending from said extruder, the cable passing through said vulcanizing tube, said vulcanizing tube having a catenary-shaped curing section extending from its inlet to a location intermediate to its inlet and outlet, and said curing section being filled with a pressurized curing medium;

(d) a take-off means disposed forwardly of said vulcanizing tube for hauling the cable in such a manner that the cable is delivered along a predetermined path in said vulcanizing tube, the cable being kept away from the internal wall of said vulcanizing tube over said catenary-shaped curing section;

(e) a positioning sensor arranged in said vulcanizing tube for sensing the position of the cable relative to the internal wall of said vulcanizing tube, said take-off means being controlled through said positioning sensor; and

(f) a load applying means disposed between said extruder and said take-off means for applying a load to the travelling cable at a location forwardly of said curing section of said vulcanizing tube and comprising a pair of opposed rotational members held against and gripping the cable and a brake means for controlling a force necessary to rotate said opposed rotational members, so that a tension exerted on the cable in a direction opposite to the direction of travel of the cable is applied to the traveling cable, thereby cancelling a tension exerted by the pressure of said curing medium on the cable in a direction of travel of the cable so as to maintain the cable in said curing section in a predetermined catenary shape.

4,416,602

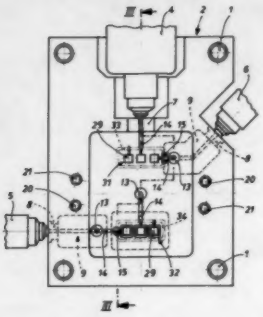
INJECTION MOLDING APPARATUS FOR MANUFACTURING ARTICLES FROM DIFFERENT TYPES OF PLASTIC MATERIAL

Ernst Neumeister, Stein, Fed. Rep. of Germany, assignor to Wilhelm Rogg Kunststoff-Metallistierung, Nuremberg, Fed. Rep. of Germany

Filed Sep. 24, 1981, Ser. No. 305,382
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1980, 3037252
Int. Cl.³ B29F 1/12
U.S. Cl. 425—130 **10 Claims**

1. In an injection mold apparatus for manufacturing molded bodies from at least two types of plastic, in which apparatus two injection units are connected to a single mold cavity, and a core piece which is movable back and forth occupies a region of the mold cavity when said core is in the blocking position, and said core in this position separates (by blocking off) a first mold cavity region (associated with the first injection unit) and the entrance opening of material coming from the first injec-

tion unit into the mold cavity from a second mold cavity region (which is connected to the second injection unit), whereby first the second mold cavity region is filled from the second injection unit and then, after the core is withdrawn, the region of the mold cavity initially occupied by said core, and the first mold cavity region, are filled from the first injection unit, and whereby the core has a recess;



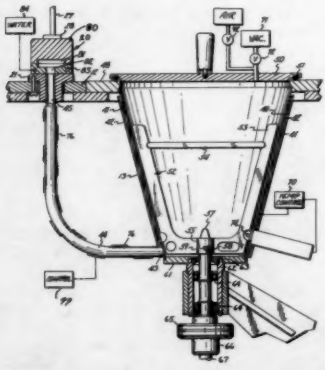
the improvement comprising that the recess is provided in the blocking region of the core and is in fluid communication with the second mold cavity region when the core is in the blocking position, and the entrance opening of material coming from the first injection unit in the mold cavity lies near the core when the core is in the blocking position.

4,416,603

LOW PRESSURE HOT MOLDING MACHINE

Michael I. Peltsman, and Israel D. Peltsman, both of 1646 Hampshire Ave. South, Minn. 55426

Filed Oct. 7, 1981, Ser. No. 309,238
Int. Cl.³ B29F *1/06*
U.S. Cl. 425—153 **19 Claims**



1. A low pressure ceramic molding machine comprising:
support including a table surface;
a molding tank mounted on said support and positioned below the table surface;
said tank including means to provide heat to the tank for heating materials in the tank and to cause ceramic materials to be heated to a level sufficient to maintain a slurry state;
means to provide fluid under a low pressure to the interior said tank to pressurize the interior of said tank and to cause ceramic material in a slurry state to be under pressure;
said tank having an outlet for permitting said ceramic material in a slurry state to be moved outwardly under such low fluid pressure in a molding cycle;
a conduit positioned exteriorly of the tank connected to said tank outlet and extending laterally from the tank to open to the table surface;
means to mount a die on said table surface, such die having a surface with an opening alignable with said conduit, whereby when the surface of such die and the table surface are held in contact ceramic material in a slurry state will be forced into such die when the tank is under pressure;
said means to mount a die including a die holder for holding such die comprising column means mounted on said support and positioned above said table surface adjacent such die and laterally offset from said tank;
a cross member mounted on said column means in position to overlie such die in place on the table surface and being spaced upwardly therefrom; and
a fluid pressure cylinder mounted on said cross member and having an extendable and retractable rod and being adapted to exert a force to hold such die with a force toward said table surface to insure communication between the die opening and the conduit during the molding cycle.

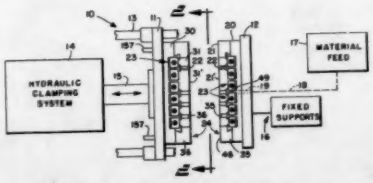
2. In a low pressure ceramic molding machine, a tank, means to provide gaseous fluid under pressure to said tank, an outlet from said tank, means for connecting said outlet to a molding die, means for heating said tank to a level sufficient to maintain a ceramic material in a slurry state whereby ceramic material will be urged by the fluid pressure in the tank through said outlet and the means for connecting, the improvement comprising means to permit using substantially all the material in the tank without waste, the tank being formed to have a generally conical shaped interior surface along substantially its entire axial working length and having the outlet provided at a location to permit discharge of material from said tank, the means for connecting the outlet to the die offset from the central axis of the tank, means to support such a die at a position offset from the central axis of the tank, the means to connect comprising a conduit that has an end directed to be coupled to a die on the means to support, and the means to selectively provide gaseous fluid under pressure to the tank selectively providing pressure at a pressure level acting on the surface of the ceramic material therein sufficient to force such ceramic material through the outlet and the means to connect without movement of the material by a mechanical element.

4,416,604

UNIVERSAL MOLDING SYSTEM AND METHOD

Ernest S. Bender, Chardon; Marty C. Ignasiak, and Michael H. Jones, both of Cleveland, all of Ohio, assignors to Associated Enterprises, Inc., Cleveland, Ohio

Filed Jun. 1, 1981, Ser. No. 269,425
Int. Cl.³ B29E *1/00*
U.S. Cl. 425—183 **41 Claims**



1. An injection molding system, comprising plural mold inserts, mold base means for supporting at least one mold insert thereon, rail means for holding at least one mold insert on said

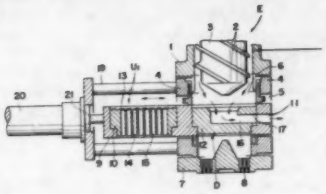
mold base means, and holding means for holding said at least one mold insert to said rail means to prevent lateral movement of said mold insert relative to said mold base means and from movement out of the plane of such mold base means while permitting sliding of said mold insert along said rail means.

4,416,605

SCREEN/DIVERTER CHANGING MECHANISM FOR EXTRUDERS

Masashi Konno, Akashi, and Osamu Ikeda, Kobe, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 4, 1982, Ser. No. 374,751
Claims priority, application Japan, May 7, 1981, 56-66511[U]
Int. Cl.³ B29F 3/06
U.S. Cl. 425—185 **5 Claims**



1. A screen/diverter changing mechanism for an extruder of the type including an extruding cylinder with an outlet at the downstream end thereof and an extruding screw rotatably disposed in said cylinder and circumferentially formed with a feed flight member for forwarding a plasticized material through the outlet of the cylinder for extrusion through a screen located at the downstream end of the extruding cylinder, said screen/diverter changing mechanism comprising:

(a) a retainer box fixed to the downstream end of the extruding cylinder, said retainer box internally defining a longitudinal flow passage for plasticized material and a transverse guide bore which is in communication with said longitudinal flow passage;

(b) a die plate fixed to the downstream end of said retainer box, said die plate being provided with a plurality of extruding nozzles in communication with said longitudinal flow passage;

(c) a slide body slidably received in said transverse guide bore, said slide body internally defining a transverse diverting port;

(d) a screen unit detachably fitted in said slide body, said screen unit internally defining a longitudinal flow passage for plasticized material, said screen unit being provided with a screen mounted in said longitudinal flow passage and, downstream of said screen, a plurality of extruding nozzles;

(e) a diverter unit detachably fitted in said slide body, said diverter unit internally defining a bent flow passage for diverting the flow of plasticized material from the extruder cylinder, the downstream end of said bent flow passage being in communication with said transverse diverting port in said slide body; and

(f) a drive mechanism linked to said slide body for selectively positioning either the upstream end of said longitudinal flow passage in said screen unit or the upstream end of said bent flow passage in said diverter unit in communication with said longitudinal flow passage in said retainer box;

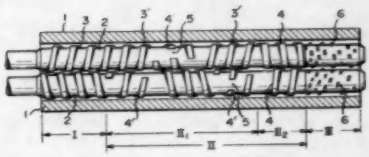
(g) said retainer box and said slide body being sized and shaped so that, when said longitudinal flow passage in said screen unit is in communication with said longitudinal flow passage in said retainer box, the portion of said slide body containing said diverter unit projects outwardly of said retainer box, permitting removal of said diverter unit and its replacement with a second screen unit.

4,416,606

APPARATUS FOR GRANULATING SODIUM PERCARBONATE

Junichiro Sugano, Nagoya; Shuichi Kobayashi, Yokkaichi; Tomoyuki Yui, Yokkaichi; Tsuneo Fujimoto, Yokkaichi, and Minoru Kubota, Yokkaichi, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 20, 1981, Ser. No. 313,199
Claims priority, application Japan, Oct. 22, 1980, 55-147760; Jul. 30, 1981, 56-119640
Int. Cl.³ B01F 7/08
U.S. Cl. 425—202 **3 Claims**



1. A granulator comprising a receptacle and a pair of intermeshing rotating screws provided therein in parallel alignment, one end of the receptacle having a hopper for charging a material, the other end thereof having a downwardly opening discharge port and the top surface thereof having a cover; wherein

the inside of said receptacle is composed of a feeding zone, a kneading zone and a breaking zone,

the feeding zone has forwardly conveying screw blades on both of the two screws,

the kneading zone is comprised of an upstream section and a downstream section, said upstream section having an alternate arrangement of a pair of a backwardly conveying screw blade on one screw shaft and a forwardly conveying screw blade on the other in opposition to each other and a pair of a forwardly conveying screw blade on said one screw shaft and a backwardly conveying screw blade on said other screw shaft in opposition to each other, said alternation of the forwardly and backwardly conveying screw blades occurring at least once in each of said screw shafts, and either one of the forwardly and backwardly conveying screw blades in each pair being discontinuous for meshing with the other screw blade in said pair, and said downstream section having backwardly conveying screw blades on both of the two screw shafts,

the blades are aligned with the same pitch in each of the feeding zone, the upstream section of the kneading zone and the downstream section thereof,

the breaking zone is of an open structure and has a plurality of projections provided on both of the two screw shafts for breaking agglomerated masses, and

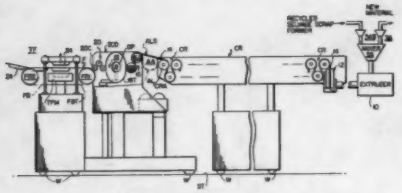
that portion of the cover of said receptacle which corresponds to the feeding zone and the upstream section of the kneading zone is a fixed cover and that portion of the cover of the receptacle which corresponds to the downstream section of the kneading zone is a movable cover.

4,416,607

APPARATUS FOR THE CONTINUOUS FORMATION OF BIAXIALLY ORIENTED THERMOPLASTIC MATERIALS AND FORMING ARTICLES THEREFROM BY INTERMITTENT FORMING MEANS INTERFACED THEREWITH

Thomas W. Winstead, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Division of Ser. No. 117,510, Feb. 1, 1980, Pat. No. 4,307,049.
This application Jun. 15, 1981, Ser. No. 273,414
Int. Cl.³ B29C 3/00
U.S. Cl. 425—325 9 Claims



1. An apparatus for extruding and presenting a continuous web of thermoplastic material in a continuous mode and transfering incremental lengths thereof to an orienting and forming device and forming products in the latter in an intermittent mode downstream of and with no effect on said continuous mode, comprising:

first means continuously extruding and presenting a web of thermoplastic material at a temperature suitable for subsequent orientation to an accumulation position;

interface means continuously ingesting said extruded web from said extruding and presenting means and intermittently discharging predetermined throw lengths of said web;

orientation means intermittently receiving said predetermined throw lengths of said web and continuously biaxially orienting said web over each said throw length;

each said throw length corresponding to a given actuation cycle of said intermittent orientation means; and

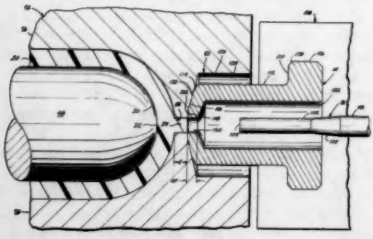
thermoformer means downstream of said orientation means and synchronized therewith to ingest such said throw length of biaxially oriented web and form products therein.

4,416,608

APPARATUS FOR FORMING PARISONS

Lawrence R. Deardurff, Swanton, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 13, 1982, Ser. No. 434,149
Int. Cl.³ B27F 1/03
U.S. Cl. 425—548 21 Claims



1. An injection nozzle comprising:

a hollow base portion;

a hollow main body portion continuous with said hollow base portion and extending outwardly therefrom;

a beveled heat transfer control portion extending inwardly of said hollow main body portion and joining with said main body portion at an acute angle and being continuous with said hollow main body; and

a mold mating portion extending inwardly of said beveled heat transfer control portion and terminating in a centrally located outlet port, said outlet port having an inwardly extending annular wall providing fluid communication with said hollow main body portion, said mold mating portion suited for contact with an injection mold inlet and said inwardly extending annular wall of said outlet portion having a height of less than 0.06 inches.

11. In an injection molding apparatus having a sectional mold and a plastic distribution manifold assembly with plasticating means for periodically supplying heated plastic material to an injection nozzle in communication with the sectional mold during a molding cycle, the improvement comprising:

said mold sections movable into sealing engagement to form a mold cavity and defining an injection nozzle accepting recess, said recess having an indwelling recess wall terminating at an acutely angled mating portion which includes a centrally located gate in fluid communication with the interior of said mold cavity;

said injection nozzle including a hollow base portion in fluid communication with said distribution manifold and insertable into said injection nozzle accepting recess and terminating in a nozzle end portion including an angled heat transfer control portion, said angled heat transfer control portion being more acutely angled than the angle of said acutely angled recess mating portion, such that said heat transfer control portion does not contact said acutely angled mating portion of said recess and said nozzle end portion including an acutely angled mating portion having a centrally located outlet port in fluid communication with said base portion and in registry with said gate portion, said acute angle being substantially equal to the acute angle of said recess wall acutely angled mating portion;

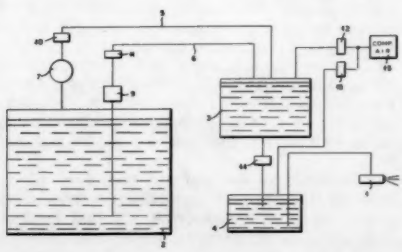
wherein, the total additive length of the inside of said gate portion of said mold and the inside of said outlet port of said injection nozzle being equal to or less than about 0.06 inches.

4,416,609

METHOD AND APPARATUS FOR BURNING WASTE OILS

Walter Weber, Lechaschau, Austria, assignor to The Firm of Jörg Santer, Schwaz, Austria

PCT No. PCT/AT80/00020, § 371 Date Mar. 2, 1981, § 102(e) Date Mar. 2, 1981, PCT Pub. No. WO81/00144, PCT Pub. Date Jan. 22, 1981
PCT Filed Jun. 27, 1980, Ser. No. 243,919
Claims priority, application Austria, Jun. 29, 1979, 4557/79
Int. Cl.³ F23K 5/00
U.S. Cl. 431—2 7 Claims



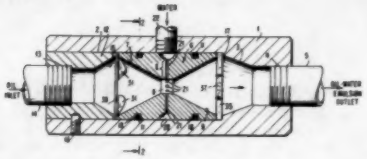
1. A method of burning waste oil comprising the steps of:

(a) collecting waste oil in a collecting vessel;
(b) applying suction to a pressure vessel and communicating said pressure vessel with said collecting vessel to draw oil from said collecting vessel through a pump-free conduit into said pressure vessel by the suction therein; and
(c) thereafter forcing oil from said pressure vessel through a pump-free conduit into an atomizing burner by applying gas pressure to said pressure vessel, thereby atomizing oil in said burner under pressure and burning the atomized oil.

4,416,610
WATER-IN-OIL EMULSIFIER AND OIL-BURNER BOILER SYSTEM INCORPORATING SUCH EMULSIFIER

John P. Gallagher, Jr., Pennsauken, N.J., assignor to Hydroil, Inc., New York, N.Y.

Continuation of Ser. No. 130,513, Mar. 14, 1980, Pat. No. 4,344,752. This application Feb. 12, 1982, Ser. No. 348,592
The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.
Int. Cl.³ F23D *13/14*
U.S. Cl. 431—4 **19 Claims**



1. In an improved oil-burning heat-producing system which has a rated maximum firing rate and which includes a firebox, means supplying fuel-oil under pressure, means supplying admix water under pressure, an emulsifier for emulsifying said water into said oil in the form of small droplets, an atomizing burner adapted to atomize said water-in-oil emulsion into tiny globules in air and to project said atomized emulsion into said firebox, whereby water globules which contain one or more droplets become still more finely atomized by the rapid vaporization of said droplets, the improvement wherein said emulsifier has:

an approximately cylindrical oil-flow constraining throat D centimeters in diameter carrying the flowing fuel oil in a given flow direction therethrough, said throat being located between smoothly converging and smoothly diverging generally conical flow surfaces which are substantially symmetrical relative to said throat;

means in communication with said smoothly converging flow surface for imparting swirling movement to the oil flow in a direction at an angle to said given flow direction before said flowing fuel oil reaches said throat; and

a multiplicity n of water-injection holes in said throat, each water-injection hole having a smaller diameter of d centimeters than said throat diameter, each of said water injection holes extending approximately radially to said throat;

the combined areas ($0.25\pi d^2$) of said n water-injection holes being 0.075 to 0.30 times the total area ($0.25\pi D^2$) of said oil-flow throat.

4,416,611
FLUE DAMPER CONTROL

Joseph C. Zivny, 208 Northwood Rd., Riverside, Ill. 60546

Filed Dec. 10, 1980, Ser. No. 215,108
Int. Cl.³ F23N *3/00*
U.S. Cl. 431—20 **11 Claims**

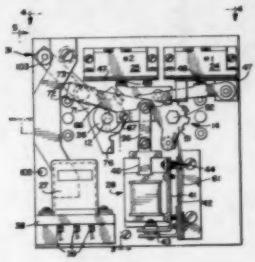
1. An automatic control for a flue damper including a damper plate mounted in a flue pipe and pivotally movable between an open position and a closed position, said control comprising in combination:

a solenoid mounted for substantially vertical movement of an armature between an energized position and a deenergized position;

a lever mechanism operatively connecting said armature to the damper plate for moving said damper plate to its open position when said solenoid is energized; and

return spring means cooperating with the damper plate for returning the damper plate to its closed position when said solenoid is deenergized;

said lever mechanism including a mounting pin parallel to the pivot axis of the damper plate, first lever means operatively connected to said armature and pivotally mounted on said pin, and second lever means operatively connected



to the damper plate and pivotally mounted on said pin adjacent said first lever means;

resilient coupling means comprising a torsion spring tensioned around said mounting pin and engaged at its ends with said first and second lever means for pivotally urging said first lever means in one direction and said second lever means in the opposite direction; and

stop means projecting from one of said lever means and engaging the other of said lever means for maintaining pre-set tension in said torsion spring;

movement of said armature to its energized position effecting rapid pivotal movement of said first lever means, and said torsion spring effecting resilient pivotal movement of said second lever means and thereby moving the damper plate to open position.

4,416,612
CIGARETTE LIGHTER

Hiromaro Tabata, Tokyo, Japan, assignor to Miki Corporation, Tokyo, Japan

Filed Sep. 1, 1981, Ser. No. 298,434
Claims priority, application Japan, Nov. 6, 1980, 55-155233
Int. Cl.³ F23Q *2/16*
U.S. Cl. 431—131 **3 Claims**

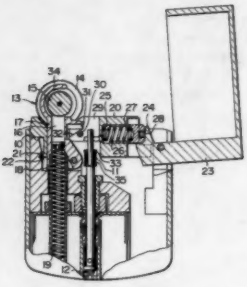
1. In a cigarette lighter of the type including a lighter body having therein a gas tank, a nozzle extending upwardly from said gas tank, an ignition system located in the upper portion of the lighter body and including a flint holder on which a striking member support wheel, a striking member and a flint are mounted, and a cover pivotally supported by the lighter body and movable between an open position in which the ignition system is exposed and a closed position in which the ignition system is enclosed by the cover, the improvement comprising:

regulating member having an opening, one end of said regulating member being pivotally supported by said lighter body and the other end thereof being pivotably supported by said cover, whereby said regulating member pivots during the opening and the closing movements of said cover;

means for pivotally supporting said flint holder on said lighter body so that said flint holder extends upwardly through said opening of said regulating member;

means for biasing said flint toward said striking member and for urging said flint holder to pivot about said means for pivotally supporting to a lowered position in which said cover can close; and

means provided on said regulating member for engaging said flint holder to prevent pivoting of said flint holder to said lowered position when said cover is open and to allow



said flint holder to pivot toward said lowered position as said cover is closed;

whereby when said cover is opened said flint holder is maintained in a raised position by said means for engaging and when said cover is closed said regulating member is lowered so that said flint holder is pivoted to said lowered position by said means for biasing.

4,416,613

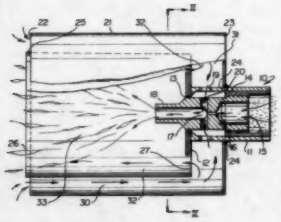
BLOWPIPE TYPE OF BURNER

Leonard M. Barisoff, Box 104, Grand Forks, British Columbia, Canada (V0H 1H0)

Filed Aug. 5, 1980, Ser. No. 175,380

Int. Cl.³ F23D *15/02*

U.S. Cl. 431—243 **2 Claims**



1. A blowpipe type of burner including a cylindrical housing, a nozzle body provided with a mixing chamber, an axial gas inlet port to said mixing chamber, a plurality of radial air inlet ports to said mixing chamber, and an axially extending burner tube connected to said mixing chamber, whereby mixed gas is substantially completely burned in said burner tube, the improvement, in combination with said burner, of a self-cooling shield, said shield comprising:

(a) a disc-like, centrally apertured baffle secured at the extreme forward end of said cylindrical housing, and having said axially extending burner tube projecting through said central aperture;

(b) an outer tubular member, secured concentrically to said cylindrical housing by a disc-like centrally apertured rear wall, said central aperture surrounding said cylindrical housing and being secured thereto, thereby to provide said outer tubular member as having a closed rear end and an annular open forward end;

(c) an inner tubular member secured concentrically within said outer tubular shield and to said disc-like baffle by a plurality of bracing connections, thereby to provide said inner tubular member as having an annular open rear end and a circular open forward end;

(d) said outer tubular member and said inner tubular member defining, therebetween, an annular chamber for back-flow of cooling air;

(e) the rear wall of said outer tubular member and said disc-like baffle defining, therebetween, a rear cylindrical chamber; and

(f) said cylindrical housing having aperture means communicating said rear cylindrical chamber with said radial air inlet ports of said mixing chamber

whereby cooling air is drawn in laminar flow into said annular chamber from the annular open end of said outer tubular member to said rear cylindrical chamber, where said air is bifurcated into two flows, a first air flow to provide combustion-supporting air to said radial air inlets, and a second air flow to enter the annular open rear end of said inner tubular member and then to be expelled, along with hot gaseous products of combustion, through an annular zone within, and along the wall of, said inner tubular member.

4,416,614

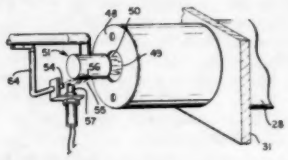
ASPHALT HEATING KETTLE APPARATUS

Albert L. Moody, Lawrenceville, Ga., assignor to F. C. Brown Rentals, Inc., Smyrna, Ga.

Division of Ser. No. 214,631, Dec. 10, 1980. This application Sep. 16, 1982, Ser. No. 418,615

Int. Cl.³ F23Q *9/00;* **E01C** *19/45*

U.S. Cl. 431—278 **5 Claims**



1. High velocity gas fuel burner apparatus with improved pilot light, comprising:

main burner means having an outlet port operative to direct a flow of gas fuel toward a burner passage at substantial velocity in a predetermined direction for ignition within said burner passage; and

a pilot gas burner providing a pilot flame originating behind said main burner outlet port and directed forwardly toward said main burner outlet port so that the pilot flame ignites the gas fuel entering said burner passage, the origin of the pilot flame at said pilot gas burner being located behind the point of ignition of the main burner and thereby not inadvertently extinguished by the ignition blast of the main burner flame.

4,416,615

FUEL BURNER CONSTRUCTION

Elmer Ketchum, Jr., 21507 H. Dr., South, Homer, Mich. 49203

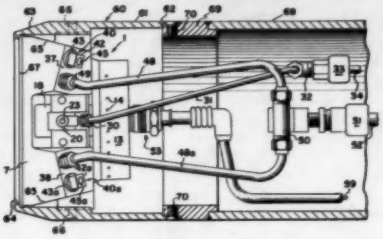
Filed Feb. 17, 1981, Ser. No. 234,832

Int. Cl.³ F23Q *9/00*

U.S. Cl. 431—285 **21 Claims**

21. A fuel burner construction comprising a pair of nozzles; means mounting said nozzles in opposed, spaced apart, directly confronting relation; an air passage extending axially completely through each of said nozzles; means for delivering fuel transversely into each air passage between its ends; and means for delivering air through the air passage of each of said noz-

zles at a velocity sufficient to atomize, entrain, and discharge such fuel from each of said nozzles, said nozzles being so



located by said mounting means that atomized fuel discharged from each of said nozzles impinges on atomized fuel discharged from the other of said nozzles.

4,416,616

WICK FOR BURNING LIQUID FUEL

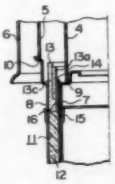
Hideharu Shimizu, Yamatokoriyama, and Akihiko Hashimoto, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 2, 1981, Ser. No. 308,138

Claims priority, application Japan, Oct. 2, 1980, 55-138548

Int. Cl.³ F23D *3/18*; F24C *5/04*

U.S. Cl. 431—325 **3 Claims**



1. A wick for burning a liquid fuel comprising:

a liquid fuel supplying section for supplying a liquid fuel; a combustion section having a lower part making detachable contact with said liquid fuel supplying section and adapted to evaporate said liquid fuel supplied through said liquid fuel supplying section, said combustion section comprising a thin sheet body consisting of ceramic fibers and a knitted or woven fabric consisting mainly of glass fibers, said fabric and sheet body being superposed on one another with the top end of said fabric projecting slightly above the top end of said thin sheet body, said lower part of said combustion section being formed of a knitted or woven fabric mainly consisting of glass fibers for detachably coupling said combustion section with said liquid fuel supplying section.

4,416,617

APPARATUS FOR BURNING SPIRIT OR SIMILAR LIQUID FUELS

Bengt E. O. Ebbeson, Halmstad, Sweden, assignor to Origoverken I Halmstad Aktiebolag, Halmstad, Sweden

PCT No. PCT/SE79/00195, § 371 Date Sep. 26, 1980, § 102(e) Date Sep. 26, 1980, PCT Pub. No. WO80/01602, PCT Pub. Date Aug. 7, 1980

PCT Filed Sep. 26, 1979, Ser. No. 197,108

Claims priority, application Sweden, Jan. 29, 1979, 7900744

Int. Cl.³ F23D *3/40*

U.S. Cl. 431—326 **8 Claims**

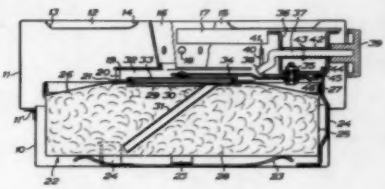
1. Apparatus for burning spirit, or a similar liquid fuel, comprising

a container means for containing said fuel and absorbing means for absorbing said fuel, said container means having a surface for exposing said absorbing means,

a burner tube located above said container means and physically separate therefrom,

a flange means extending outwardly from a lower edge of said burner tube,

a ring secured to said flange means and spaced from said flange means to form a gap for the intake of combustion



air between said tube and said absorbing means, said ring having an aperture adapted to be aligned with said surface of said container,

a plate for covering said aperture, mounted for pivotal movement between said ring and said flange,

elastic biasing means for urging said container means against said ring to align said surface and said aperture, and

wherein the burner tube (16) is a truncated cone with the smaller end below the larger end.

4,416,618

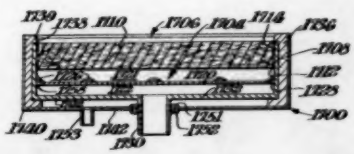
GAS-FIRED INFRA-RED GENERATORS AND USE THEREOF

Thomas M. Smith, 114 Villinger Ave., Cinnaminson, N.J. 08077

Continuation-in-part of Ser. No. 238,418, Feb. 26, 1981, Ser. No. 186,491, Sep. 12, 1980, Pat. No. 4,378,207, Ser. No. 178,121, Aug. 14, 1980, Pat. No. 4,373,904, Ser. No. 20,079, Mar. 13, 1979, Pat. No. 4,290,746, and Ser. No. 952,332, Oct. 18, 1978, Pat. No. 4,326,843, said Ser. No. 20,079, and Ser. No. 952,332, each is a continuation-in-part of Ser. No. 906,229, May 15, 1978, Pat. No. 4,157,155, said Ser. No. 20,079, Ser. No. 186,491, Ser. No. 952,332, and Ser. No. 178,121, each is a continuation-in-part of Ser. No. 863,251, Dec. 22, 1977, Pat. No. 4,224,018, said Ser. No. 238,418, Ser. No. 20,079, Ser. No. 186,491, Ser. No. 952,332, and Ser. No. 178,121, each is a continuation-in-part of Ser. No. 94,901, Nov. 16, 1979, Pat. No. 4,272,238, and Ser. No. 775,838, Mar. 9, 1979, Pat. No. 4,272,237. This application Jun. 30, 1981, Ser. No. 279,081

Int. Cl.³ F23D *13/12*

U.S. Cl. 431—328 **8 Claims**



1. A gas-fired infra-red generator having a thick porous ceramic fiber matrix through the thickness of which a combustion mixture is passed to emerge from one face and to burn on that face, that matrix face being entirely uncovered so that the burning extends completely over that face, the edges of the matrix around that face being fitted in the mouth of a plenum body and adherently sealed against the inside surface of the mouth by silicone adhesive that withstands temperatures as high as about 450° F., the mouth around the adhesive being of

metal sufficiently thick to carry off heat and keep its temperature low enough to thermally protect the adhesive.

4,416,619

POROUS CERAMIC COMBUSTION REACTOR

Laurence B. Craig, Glen Cove, and Alfred J. Farina, Baldwin, both of N.Y., assignors to Thermocatalytic Corp., Williston Park, N.Y.

Filed Aug. 20, 1981, Ser. No. 294,463
Int. Cl.³ F23D 13/12
U.S. Cl. 431—328 1 Claim

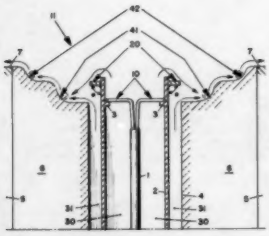
1. A porous ceramic reactor for use in a heating system, said reactor being tubular and having an outer surface at which combustion occurs, said outer surface having indentations to break up the surface continuity in the form of at least two spirals of opposing twist, providing a lozenge pattern, extending continuously along the length thereof.

4,416,620

LARGER CAPACITY VORTEX BURNER

Charles W. Morck, Philadelphia, Pa., assignor to Selas Corporation of America, Dresher, Pa.

Filed Jun. 8, 1981, Ser. No. 271,494
Int. Cl.³ F23D 13/12
U.S. Cl. 431—348 11 Claims



1. A vortex burner comprising:

a. a burner block adapted to be inserted in a furnace wall, the block having a cup and a bore extending through the block to the cup base;

b. primary air supply means within the bore having a forward end extending beyond the cup base;

c. fuel gas supply means, having nozzles, within the primary air supply means for mixing fuel gas with primary air and imparting a whirling flow pattern to the primary air and fuel gas mix as it exits from the forward end of the primary air supply means;

d. secondary air supply means surrounding the primary air supply means within the bore;

e. means for deflecting the secondary air flow into a depression in the cup surface; and

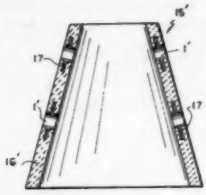
f. means for deflecting the whirling primary air and fuel gas mix into the depression for mixing with the secondary air and for anchoring the primary air, secondary air and fuel gas mixture to the cup surface.

4,416,621

CERAMIC COMBUSTION CHAMBER AND METHOD OF MAKING IT

Werner Huther, Karlsfeld, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 14, 1981, Ser. No. 292,861
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1980, 3031689
Int. Cl.³ F23D 15/02
U.S. Cl. 431—352 1 Claim



1. A tubular ceramic combustion chamber wall having a plurality of air inlet ports each extending completely through the thickness of the wall, and a double wall formation extending around each of the inlet ports, the two walls of each formation being formed by an annular slot in the wall of its respective port, and the depth of each slot being at least equal to the thickness of the chamber wall.

4,416,622

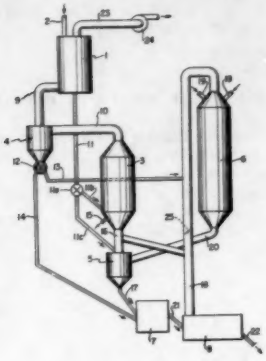
METHOD AND PLANT SUCH AS A KILN PLANT FOR TREATING GRANULAR OR PULVEROUS RAW MATERIAL

Jorn Touborg, Copenhagen, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Nov. 20, 1981, Ser. No. 323,368
Claims priority, application United Kingdom, Nov. 25, 1980, 80377729
Int. Cl.³ F27B 15/00; F26B 7/02; C04B 7/02
U.S. Cl. 432—14 10 Claims

1. Method for treating pulverous raw materials in a kiln plant including a generally stationary reaction zone coupled upstream to a preheating zone and a precalcination zone and downstream to a cooler, comprising preheating the material in the preheating zone in suspension, precalcining the preheated material in the precalcination zone in suspension, separating the precalcined material from smoke gases in a separator zone, dividing the precalcined separated material into a first material flow and a second material flow, suspending the first material flow in cooling air from the cooler, burning and melting the suspended first material flow in the generally stationary reaction zone, separating the melted first material flow in a cyclone from smoke gases, feeding the melted material flow to a rotating nodulisation drum coupled downstream of the cyclone, feeding the smoke gases separated from the melted first material flow to the precalcination zone as combustion air, feeding

the second material flow directly to the rotating nodulisation drum for mixing with the melted material flow so that the



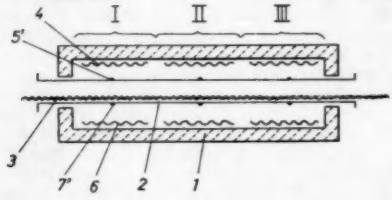
mixture is nodulised therein, and feeding the nodulised mixed material flows to the cooler.

4,416,623

MUFFLE FURNACE

Susumu Takahashi, Yokohama, Japan, assignor to Kanto Yakin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,603
Int. Cl.³ F27B *1/26, 5/14;* F27D *11/00*
U.S. Cl. 432—36 **4 Claims**



1. In a muffle furnace in which a plurality of successive heating zones are provided along the length of an elongate, metallic muffle which extends longitudinally through said heating zones, the improvement comprising

a pair of spaced, independently operable heaters provided in each of said heating zones adjacent the upper and lower sides, respectively, of said muffle,

a pair of temperature sensors mounted on said upper and lower sides, respectively, of said muffle in each of said zones,

means for operating one of said heaters in each of said zones until a predetermined temperature is detected by one of the corresponding pair of sensors in the associated zone, and

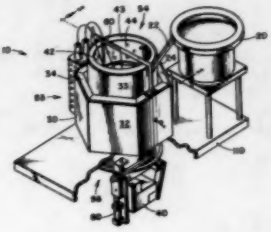
means for controlling the operation of the other of said heaters in each zone to minimize the difference in temperatures detected by the corresponding pair of sensors in the associated zone.

4,416,624

VERTICAL TUNNEL KILN

Terry R. Bloom, Middlebury, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed Nov. 27, 1981, Ser. No. 325,111
Int. Cl.³ F27B *9/14*
U.S. Cl. 432—134 **16 Claims**



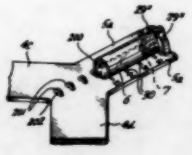
1. A vertical tunnel kiln that transmits parts downwardly for firing and removes volatiles by the exhaust of gases from the interior of said kiln, comprising a casing forming an interior core, a helical ramp extending from one end of said vertical tunnel kiln to an oppositely disposed end of said vertical tunnel kiln and providing a track adapted to receive said parts thereon which are subjected to temperature gradients as they progress downwardly from the upper to the lower end of said kiln, heating means for heating said kiln which receives and confines said heat to fire said parts, means forming interior baffles for controlling the movement of gases through said kiln and to effect preferred temperature gradients within said kiln as the parts on said track progressively advance from the upper to the lower end of said kiln, means for developing a vibratory force communicated to said track whereby the parts are successively advanced from the upper to the lower end of said kiln, feeder means for orienting and supplying said parts to the upper end of said track, and timed discharge means for controlling the discharge rate of said parts at the lower end of said kiln, whereby said interior baffle means controls the flow of gases through said kiln to effect an exhaust of volatiles from said kiln as said parts move downwardly through said temperature gradients and are fired.

4,416,625

ORTHODONTIC SPRING FORCE ADJUSTMENT AND DISCONNECTIBLE CONNECTION

Maclay M. Armstrong, Seattle, Wash., assignor to Northwest Orthodontics, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 33,111, Apr. 25, 1979, Pat. No. 4,368,039, which is a continuation-in-part of Ser. No. 655,401, Feb. 5, 1976, Pat. No. 4,155,161, which is a continuation-in-part of Ser. No. 613,243, Sep. 15, 1975, abandoned. This application Feb. 26, 1980, Ser. No. 124,842
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—5 **13 Claims**



1. In an orthodontic appliance including force-reaction means engageable with the wearer's head and/or neck, an

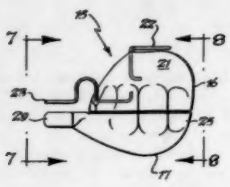
orthodontic treatment force-applying device for applying a force to a jaw and resilient force-producing means connected between the force-reaction means and the force-applying device, the improvement comprising the force-producing means including a helical spring having a hook carried by one end thereof, and a plurality of arches carried by the appliance, arranged in a row aligned with said spring and selectively engageable by said hook for adjusting the degree of force produced by said spring.

4,416,626

METHOD FOR RECAPTURING ANTERIOR DISPLACED MANDIBULAR DISC AND ORTHOPEDIC DEVICE THEREFOR

William D. Bellavia, 511 West Ave., Medina, N.Y. 14103

Filed Oct. 19, 1981, Ser. No. 312,759
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—7 **14 Claims**



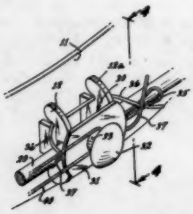
1. A method of recapturing an anterior displaced mandibular disc comprising the steps of moving the mandible to an anterior position from its normal position to increase the vertical height between the condyle and fossae, firmly retaining the mandible in said anterior position to permit said mandibular disc to become displaced to a more posterior position, periodically moving said mandible to a more posterior position in increments until it is returned to a permanent position which is anterior to its original normal position, and providing sufficient clearance between the lower and upper molars to permit eruption of certain of said molars during said periodic movement of said mandible, to thereby cause said erupted molars to maintain the increased vertical height.

4,416,627

ORTHODONTIC APPLIANCE

William W. Beazley, 3055 El Vido, Los Angeles, Calif. 90049

Filed Jun. 7, 1977, Ser. No. 804,345
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—18 **4 Claims**



1. An orthodontic appliance for use in combination with an orthodontic arch wire and an elastic band and including a band fitted around a tooth comprising in combination:

a pair of T-shaped brackets on the band each having a groove on top, the grooves being aligned with each other and receiving the arch wire;

a ligating member having a base placed on top of the grooves and retaining the arch wire therein, there being wire ends secured to the base and tied under the T-shaped brackets and twisted together to hold the member on the brackets; and

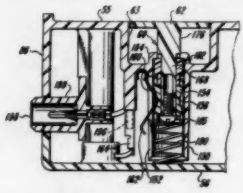
the member having a hook on top of the base as anchoring post for a loop of the elastic band.

4,416,628

PUSH-BUTTON SWITCH AS USED IN ORAL HYGIENE APPLIANCE

Michael A. Cammack; Christopher W. Elkins; Clarence J. Hickman, and Keith M. Mullins, all of Ft. Collins, assignors to Teledyne Industries, Inc.

Division of Ser. No. 97,039, Nov. 23, 1979. This application Apr. 27, 1981, Ser. No. 257,919
Int. Cl.³ A61G *17/02*
U.S. Cl. 433—80 **6 Claims**



1. In a device which includes a supply of liquid, a pump for propelling said liquid, and means for delivering the propelled liquid to a point of use, the improvement comprising:

a housing defining a cavity within which said pump is seated;

means defining an outlet in said housing;

means defining an inlet coupling member in said housing;

an electric motor seated in said cavity for driving said pump;

a button depressably mounted in an exposed position in a wall of said housing;

a barrel disposed in said housing beneath said button with an opening being defined through the wall of said barrel;

a spool slidable longitudinally within said barrel and having a pair of axially-spaced external wall surfaces facing said opening individually at respective different distances therefrom;

means coupled between said button and said spool for moving said spool axially between first and second positions in alternate directions upon successive depressions of said button;

a resilient conductive finger projecting through said opening and against said spool, movement of said spool between said first and second positions serving to align respective different ones of said surfaces in engagement with said finger and correspondingly change locations of a contact portion on said finger;

a conductive contact element disposed in the path of said contact portion and engageable with disengageable therewith upon change between said locations;

and means for connecting said contact portion and said contact element in circuit with said motor.

4,416,629

OSSEOINTERFACED IMPLANTED ARTIFICIAL TOOTH

Peter G. Mozsary, 530 Tennessee Ave., Vallejo, Calif. 94590, and Robert E. Lapcevic, 40 N. Gate Victoria Ave., Milpitas, Calif. 95035

Filed Jul. 6, 1982, Ser. No. 395,139
Int. Cl.³ A61C *8/00*
U.S. Cl. 433—174 **8 Claims**

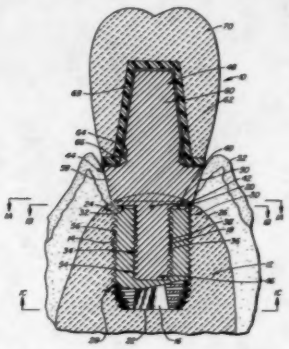
1. An artificial tooth implantable in a jaw bone comprising:

a. an implantable tooth root, said root having a distal end portion intended for extending into the jaw bone and a proximal end portion being accessible from the outer

surface of the jaw bone; said root further including a hollow extending from said proximal end portion of said root toward said distal end portion of said root;

b. means for fixing said root to the jaw bone;

c. a post, said post having a first portion fitting within said hollow of said root and a second portion extending outwardly from said hollow; said second portion having an outer surface which slopes downwardly toward said first



portion of said post said second portion of said post further including a base connected to said first portion or said post; a stem extending from said base; and a weakened portion at said connection between said base and stem for breakably connecting said base to said stem;

d. means for fixing said first portion of said post within said hollow of said root;

e. a crown connected to post.

4,416,630

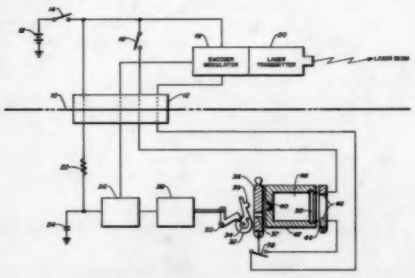
WEAPONS EFFECT SIGNATURE SIMULATOR

James M. Hagen, Riverside, and James D. King, Sierra Madre, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 1, 1982, Ser. No. 344,859

Int. Cl.³ F42D *7/00;* **F41F** *27/00*

U.S. Cl. 434—16 **7 Claims**



1. In a weapons effect signature simulator for use with a weapons engagement simulator, said signature simulator comprising:

a means for responding to the simulated firing of a rocket propelled weapon; means providing a report, flash and smoke associated with the actual firing of a weapon; means to determine if said signature simulator is correctly loaded; and means to inhibit the firing of said weapons simulator when incorrectly loaded.

4,416,631

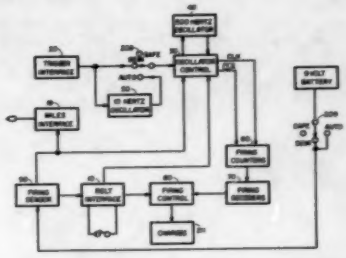
SMALL ARMS FIRING EFFECTS SIMULATOR

Christopher R. Dawson, Glendora, and Ronald E. Purkis, Upland, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 8, 1982, Ser. No. 375,797

Int. Cl.³ F41C *13/00*

U.S. Cl. 434—16 **13 Claims**



1. A small arms fire simulator for use with a rifle utilizing the magazine, ejection port, and trigger of said rifle, comprising:

a plurality of pyrotechnic charges;

means for packaging said charges into a magazine for insertion into said rifle including:

an expendable plastic casing having configured therein a plurality of cylindrical wells having an exit orifice, for fixedly receiving said pyrotechnic charges;

ignition bridge wires embedded within each of said wells and within each of said pyrotechnic charges;

metal silkscreened conductive area connecting said bridge wires in adjacent wells; and

means for electronically controlling the order and rate of discharge for said pyrotechnic charges operably connected to said charges and the trigger mechanism of said rifle.

4,416,632

PAINT-BY-NUMBERS KIT

Mort Berman, Brooklyn, N.Y., assignor to Avalon Industries, Inc., Brooklyn, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,626

Int. Cl.³ G09B *11/10*

U.S. Cl. 434—84 **6 Claims**

1. A watercolor kit for producing watercolor pictures, comprising:

(a) a picture sheet having a plurality of picture areas to be painted on a paint-receiving work surface of the sheet, and a plurality of water-insoluble picture lines on the work surface and together with the picture areas constituting a picture;

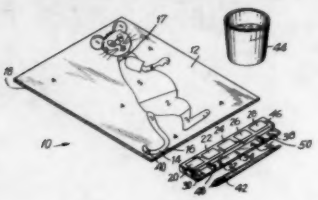
(b) a plurality of different water-based watercolor paints for

application to the work surface of the picture sheet to produce a watercolor picture;

(c) a plurality of different selector means for identifying the different colors of the water-based paints;

(d) a plurality of different water-soluble indicia means each located on the work surface in a respective picture area thereon, each indicia means corresponding to a respective selector means for identifying which water-based paint color is to be applied to the respective picture area; and

(e) brush means for applying a selected water-based paint color on the work surface directly over the respective picture area and directly over the water-soluble indicia



means located therein and in disappearing relationship with the same to thereby cause the selected water-based paint color itself to dissolve the water-soluble indicia means, and for applying the water-based paint colors over the water-insoluble picture lines and in non-obscuring relationship therewith to thereby permit the picture lines to be visible even if directly covered on the work surface by the water-based paints,

whereby the watercolor picture is not marred by the unsightly presence of the indicia means appearing through the applied watercolor paints, and by the covering of the picture lines.

4,416,633

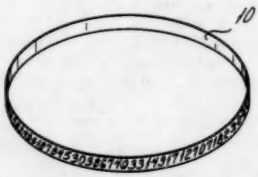
EDUCATIONAL AND RECREATIONAL MATHEMATICAL DEVICE IN THE FORM OF A BAND, RING OR CONCENTRIC RINGS

Max A. Gulack, 880 Fifth Ave., New York, N.Y. 10021

Filed Aug. 18, 1978, Ser. No. 935,183

Int. Cl.³ G09B *19/02*

U.S. Cl. 434—188 **5 Claims**



1. An educational and recreational mathematical device comprising at least one band which is endless or adapted to have ends thereof fastened to form an endless band and a plurality of individual digits imprinted on the band at regularly spaced intervals, the digits when all read consecutively clockwise as a number constituting a quotient obtained by dividing a number constituted of $(P-1)/n$ nines, in which P is a prime number greater than 5 and n is an integer at least 1, by P and adding to the lefthand end of said quotient any number of zeros necessary to increase the number of digits in said quotinet to $(P-1)/n$, n being so selected that $(P-1)/n$ nines is the minimum number of nines divisible by P so that said quotient is an integral number.

4,416,634

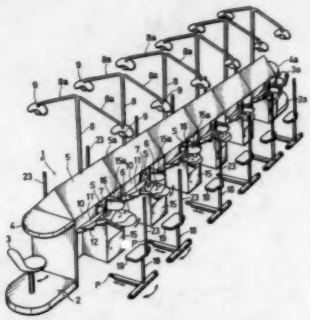
DENTAL PRACTICE MEANS

Daryl R. Beach, 8-2, Wado-cho, Atami-shi, Shizuoka-Pref, Japan

Filed Feb. 1, 1982, Ser. No. 344,401

Int. Cl.³ G09B *23/28*

U.S. Cl. 434—263 **1 Claim**



1. An assembly for training concurrently one or more dental trainees, comprising, in combination,

a plurality of pairs of training stations positioned on a floor and connected to each other in an extended straight line with two ends, each pair having face-to-face seating positions for a pair of said dental trainees;

a table positioned on each of said ends of said line of connected plurality of stations for use by instructors;

a platform raised above said floor at a predetermined height and disposed at each of said ends; and

a horizontally and vertically movable chair attached by support base to said platform at each end, for seating said instructor at a suitable level for unobstructed observation of said trainee and hands of said trainees; and wherein

each of said stations comprises

a sloping top for each pair of stations thereby to form, in cross section, a triangle, whereby said sloping tops extend continuously from one end of said line to the other end of said line;

each pair of stations having connected at the top of said sloping top, a vertical support means with a pair of horizontal support means extending therefrom at the top of said vertical support means and in opposing directions, and light means at the end of each horizontal support means, said horizontal and vertical support means disposed so that said light means is positioned above a position holding a patient's head sample;

a support table for holding said patient's head sample, said supporting table holding means for supplying vacuum or other power directing means;

a shelf extending between each of a pair of stations;

a section shelf disposed to the right of said supporting table;

a dental tray held adjacent said head sample and on said second shelf;

a plurality of cabinets disposed below said second shelf, for holding one or more dental tools;

a chair for holding said trainee to be within easy working area of said sample head, said chair comprising a T shaped base, having one end of a leg of said T, rotatably connected to said floor, and a top bar of said T having wheels connected at the ends thereof, whereby said chair is rotatable about said connected leg end so that said dental trainee is within a prescribed work area of

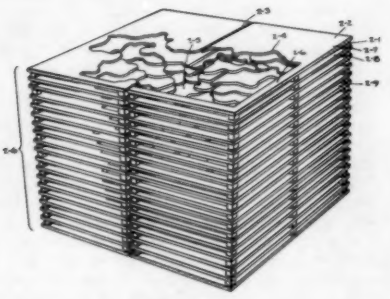
said head sample at all times, and said chair further comprising a vertical base support connected to said T support base, a seat connected to said vertical base support, and a vertically extending rod connected to said seat at the back thereof and toward the middle thereof, whereby a dental trainee has a constant check on his posture by contact of his back against said vertically extending rod; whereby the entire assembly has suitable positioning of all components thereof so that said instructor can readily observe without any substantial obstruction, said dental trainees and their hands.

4,416,635

MOLECULAR MODELS

Graham M. Smith, Scotch Plains, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 24, 1981, Ser. No. 334,196
Int. Cl.³ G09B *21/26*
U.S. Cl. 434—280 **2 Claims**



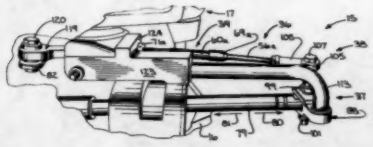
1. A scale model illustrating the space filling nature of atoms in a molecular structure, comprising a plurality of adjacent parallel relatively thin rigid flat sheets, each sheet cut out to represent a cross section plane of an individual molecule having edges defining the boundary of space filling atoms intersecting said cross section, said parallel sheets ordered to represent sequential cross sectional planes of a molecular structure in axial alignment whereby said edges define a surface boundary of said molecular structure.

4,416,636

CONNECTOR FOR VANE STEERING OF MARINE DRIVE

James Boda, Winneconne, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 16, 1981, Ser. No. 321,752
Int. Cl.³ B63H *21/26*
U.S. Cl. 440—51 **8 Claims**



5. A steering system for a boat, comprising

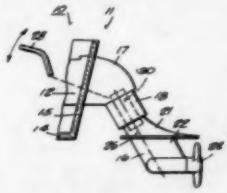
a lost motion connector having a notch to rotatably retain an axially movable input member, said notch having sides to pivotally retain said axially movable input member and ends to form stops limiting the rotation of said lost motion connector with respect to said axially movable input member, said input member operatively connected to rotate a pivotal vane located within the slip stream of a drive unit to control the direction of boat movement in response to the movement of said input member when spaced from said stops, said input member operatively connected to directly rotate said drive unit in response to the movement of said input member when engaging one of said stops to control the direcion of boat movement.

4,416,637

MARINE STEERING MECHANISM AND ASSOCIATED ACTUATING AND LOCKING DEVICE

Gerald E. Kashmerick, Lindenhurst, Ill., and Lawrence E. Zdanowicz, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 13, 1981, Ser. No. 282,407
Int. Cl.³ B63H *21/26*
U.S. Cl. 440—60 **20 Claims**



1. A marine propulsion device comprising a movable steering member, a movable steerable member including a propeller, and steering means operatively connected with said steering member and said steerable member and including a cylinder having opposite first and second end portions, a piston operatively connected with said steering member for reciprocative movement within said cylinder between said first and second end portions in response to movement of said steering member and for permitting movement of said steerable member in response to movement of said steering member, supply means communicating with each of said first and second cylinder end portions and adapted for communication with a sump, said supply means being operative, in response to steering member movement effecting movement of said piston away from one of said cylinder end portions, for conducting hydraulic fluid from the sump into said one of said cylinder end portions, and discharge means communicating with each of said first and second cylinder end portions and adapted for communication with a sump, said discharge means being operative, in the absence of movement of said steering member, for blocking hydraulic fluid flow from each of said cylinder end portions so as thereby to lock said piston against movement in said cylinder, and being further operative, in response to movement of said steering member effecting movement of said piston away from said one cylinder end portion, for affording hydraulic fluid flow from the other of said first and second cylinder end portions to the sump so as thereby to free said piston for movement within said cylinder.

4,416,638

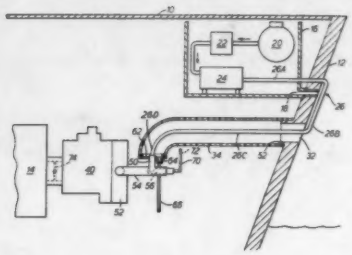
APPARATUS FOR FEEDING FUEL TO A MARINE ENGINE

Frank Ellis, 56, Thamespoint, Fairways, Broom Rd., Teddington, Middlesex, England TW11 9PP

Continuation of Ser. No. 131,476, Mar. 18, 1980, abandoned. This application Aug. 26, 1982, Ser. No. 411,873
Claims priority, application United Kingdom, Mar. 20, 1979, 7909743; Mar. 28, 1979, 7910874; Apr. 11, 1979, 7912882
Int. Cl.³ B63H *21/00*
U.S. Cl. 440—88 **11 Claims**

1. Apparatus for feeding liquified petroleum gas fuel which is gasified and fed to the carburetor of an internal combustion

engine comprising a generally annular chamber having an inner wall provided with a plurality of peripherally spaced orifices and connectible to a fuel feed pipe and mountable on the carburetor such that gasified fuel flows through the orifices thereof to the carburetor, a conduit connected to the annular chamber, a branch pipe connected to the conduit to provide a fuel duct from the fuel feed pipe to the conduit, a helical rotary scroll valve located in the conduit to obturate an adjustable

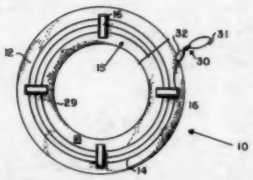


proportion of the branch pipe opening into the conduit dependent upon the rotational position of the scroll valve, a radial lever connected to the scroll valve to cause rotary motion thereof, an adjustment means for the area of the annular chamber orifices comprising a slide plate having further orifices corresponding to the chamber orifices and movable to bring the chamber orifices and further orifices progressively into and out of strict register, and means for clamping the slide plate at any required position within its range of movement.

4,416,639
MANAGEABLE SAFETY DINGHY
Thomas C. Gillmer, 1 Shipwright Harbor, Annapolis, Md. 21401
Filed Jun. 22, 1981, Ser. No. 275,912
Int. Cl.³ B63H *16/06*
U.S. Cl. 440—106 **14 Claims**

1. A manageable safety means for a vessel, comprising:
a vessel;
a pair of oars;
a flotation means, said flotation means being suitable affixed to the exterior surface of said vessel, said flotation means providing a positive bouyancy and stability to said vessel for safety;
a pair of oarlock means, said oarlock means being adjustable, said adjustable oarlock means being affixed to an interior surface of said vessel, said pair of oars being removably inserted into and through said pair of oarlock means, said adjustable oarlock means being positioned so as to position said oars removably inserted therein so as to clear said flotation means, said adjustable oarlock means providing a flexibility to provide the best rowing trim for said vessel and to provide a managing capability to arrange seating of passengers and stowing of gear to enhance said safety, each of said oarlock means of said pair of adjustable oarlock means consisting of a track means, said track means being located on said interior surface of the gunwale of said vessel, said track means being affixed by suitable means to said interior surface of said gunwale of said vessel, the exposed surface of said track means having a plurality of detent indentations therein, a slide means, said slide means being slidably affixed to said track means, said slide means sliding freely on said track means, said slide means having a threaded aperture therein and therethrough, a socket means, said socket means being affixed to said slide means by suitable means, a fastening means, said fastening means having a first end and a second end, said first end being cylindrical and threaded on the outside thereof, said second end having a knob-like configuration, said first end of said fastening means being removably and threadably inserted into said threaded aperture in said slide means, said knob-like configuration of said second end of said fastening means being used in manually turn said threaded end thereof in said threaded aperture to thereby tighten said fastening means against said track means and thereby locking said slide means in place, the distal end of said first end being further located when locking so as to enter one of said plurality of said detent indentation, and a pair of oarlock ring means, said oarlock ring means having a first end and a second end, said first end being configured as an open circular ring, said second end being configured as a rod-like pin, said rod-like pin being suitably affixed to the outer periphery of said open circular ring so as to project longitudinally outwardly therefrom, said oarlock ring means being removably inserted into said socket means by inserting said projecting rod-like pin portion into said socket means; and
a longitudinal seat means, said longitudinal seat means running in a fore and aft direction in relation to said vessel, said longitudinal seat means being located on the longitudinal center-line of said vessel, said longitudinal seat means facilitating the positioning of a rower operating said pair of oars in said pair of adjustable oarlock means.

4,416,640
LIFE RING
Jay P. Eickenhorst, Stinson Beach, Calif., assignor to Dennis J. Romano, San Francisco, Calif., a part interest
Filed Mar. 16, 1981, Ser. No. 244,269
Int. Cl.³ B63C *9/08*
U.S. Cl. 441—81 **3 Claims**



1. An improved life ring, comprising:
a generally doughnut-shaped ring buoy having a top surface, a bottom surface, a closed, generally convex edge wall that defines the circumferential exterior of the ring buoy, and an inner circular edge;
a rope connected at one end to said ring buoy and having a free end for holding when said ring buoy is thrown; and
a series of releasable attachment means solely on one of said top and bottom surfaces of the ring buoy, spaced angularly apart on said one surface, for retaining the rope visibly exposed, coiled circumferentially along said one

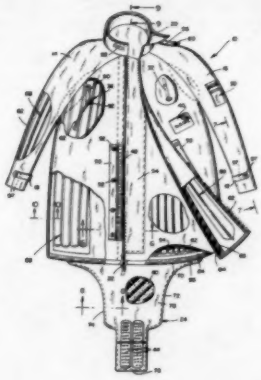
surface and for quickly and immediately releasing the entire coil of rope with little resistance to the travel of the ring buoy when it is thrown, in any orientation, with the rope's free end held, said releasable attachment means consisting of a series of strips disposed in generally radial configuration on said one surface and each having a component extending over the coil of rope with means for releasing the components in response to pressure from any direction of pull which the rope can exert when the ring buoy is thrown.

4,416,641

ANTI-EXPOSURE JACKET

Dominic J. Spinosa, Wantagh, and Frank Knoll, Huntington Station, both of N.Y., assignors to East/West Industries, Inc., Farmingdale, N.Y.

Filed Aug. 28, 1981, Ser. No. 297,239
Int. Cl.³ B63C *9/10*
U.S. Cl. 441—94 **11 Claims**



1. A garment for protecting the wearer thereof from exposure to the elements comprising:

A. a jacket having a body portion tailored to fit the torso of said wearer and arm portions for covering the arms of said wearer, said jacket body and arm portions including;

(i) an inner and outer layer of material forming a chamber therebetween,

(ii) fastening means disposed about the edges of said body portion and at specific locations on the inner rear and front outer surfaces of said body portion, said arm portions being sealed at the edges thereof, and

(iii) crotch means having one end affixed to the lower edge of said outer layer of material, said crotch means being positionable between the legs of said wearer with the other end thereof fastened to said front outer surface of said body portion when in use and being fastened in position at the inner rear surface of said outer layer of material when not in use;

B. insulation means affixed to the outer surface of said inner layer of material and disposed within said chamber, formed by said inner and outer layers;

C. inflatable bladder means including;

(i) a back section having fastening means along its side edges,

(ii) a pair of arm sections having fastening means along its side edges, and

(iii) a pair of front sections having fastening means, all of said sections being joined together about the periphery of a neck opening, said arm sections being adapted to be rolled and joined at said arm section fastening means into tubular sleeves, said back section being additionally joined to said front section by cooperation of their respective fastening means, said bladder means being adapted to be received within said chamber between said insulation means and the inner surface of said outer layer of material; and

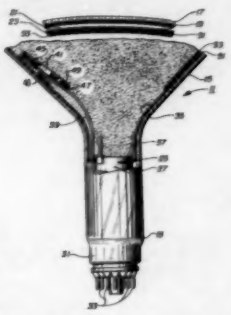
D. means for inflating said bladder means.

4,416,642

METHOD FOR PREVENTING BLOCKED APERTURES IN A CATHODE RAY TUBE CAUSED BY CHARGED PARTICLES

David D. VanOrmer, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 28, 1981, Ser. No. 287,563
Int. Cl.³ H01J *9/20*
U.S. Cl. 445—11 **1 Claim**



1. A method of processing an evacuated cathode-ray tube having an envelope with a conductive coating disposed on an interior surface portion thereof, a luminescent viewing screen within said envelope, means for producing at least one electron beam for exciting said screen to luminescence, an apertured mask having an interior surface facing said electron beam producing means, said mask being closely spaced from said screen, an evaporator assembly for depositing a primary metal film on the interior surfaces of said funnel portion of said envelope and of said mask, and gettering means for depositing a gas-sorbing getter material film on said primary metal film, the method including the steps of:

agitating said tube so as to dislodge any insulative particles therein,

orienting said tube so that any of said insulative particles are disposed upon said interior surfaces,

depositing a substantially uniform and continuous primary metal film on said interior surfaces thereby rendering conductive any of said insulative particles disposed on said surfaces, and

applying said gas-sorbing getter material film to said primary metal film.

4,416,643

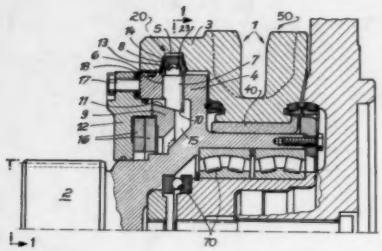
PLANAR DRIVE DEVICE

Ernst Braun, and Gert Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun, Fed. Rep. of Germany

Filed Feb. 5, 1981, Ser. No. 231,755
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004663
Int. Cl.³ E21C *27/34, 29/16*
U.S. Cl. 464—38 **9 Claims**

1. A planer drive mechanism comprising, a sprocket wheel for driving a planer chain, a drive shaft for driving the sprocket wheel, said sprocket wheel having a secondary rim, said drive shaft having a primary rim, friction clutch means connected between said primary and secondary rims for permitting limited movement therebetween, said secondary rim having a circular groove of trapezoidal cross-section defined therein, said primary rim having a plurality of radially extending cir-

cumferentially spaced bores therein aligned with said circular groove, a coupling bolt movably received in each of said bores adapted to be moved toward said circular groove, each coupling bolt having a tapered bolt head secured on a side thereof adjacent said circular groove, a centering ring movably mounted on said drive shaft having a bevelled surface in engagement with a base of each of said coupling bolts, a pressure ring connected to said drive shaft and bearing against said centering ring to bias said coupling bolts radially outwardly toward said circular groove through said bevelled surface and said coupling bolt bases, each of said tapered bolt heads com-



prising a separate friction segment frictionally engaged with said circular groove, said friction segments are shaped and distributed in said circular groove to form a substantially continuous friction ring having a small clearance between adjacent friction segments in a circumferential direction of said circular groove, each coupling bolt includes a small diameter portion with a centering cone, each friction segment having a blind bore therein for receiving said small diameter portion and centering cone for biasing said friction segments at a central location thereof into engagement with said circular groove whereby each friction segment is bulged outwardly at a central portion thereof in said circular groove.

4,416,644

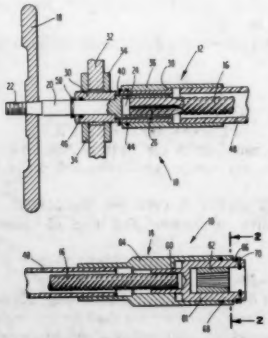
FLEXIBLE SHAFT ASSEMBLY WITH UNIVERSAL ADAPTER

Walter Kulischenko, East Brunswick; William F. Bogan, Somerville, and William C. Ellis, Bridgewater, all of N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 1, 1982, Ser. No. 344,462

Int. Cl.³ F16C *1/02, 1/08*

U.S. Cl. 464—52 **8 Claims**



1. Apparatus for turning a valve stem of a valve by means of a handwheel rotating a flexible shaft, said apparatus comprising:

a sleeve mounted in a supporting member,

means rotatable within said sleeve and interconnecting one end of said flexible shaft with said handwheel, said flexible shaft having an outer casing in longitudinal alignment with said sleeve,

a first ferrule rotatably mounted over an inner end of said sleeve and affixed to one end of said casing,

a socket member secured to the other end of said flexible shaft,

a second ferrule secured to the other end of said casing, said socket member rotatably mounted within said second ferrule, and

other means seated within said socket member for engaging said valve stem whereby rotation of said handwheel and flexible shaft causes said socket member to rotate therewith while said first ferrule is independently rotatable to automatically relieve torsional stresses in said casing, said second ferrule and said first ferrule rotating in accordance with each other and said ferrules rotating said casing.

4,416,645

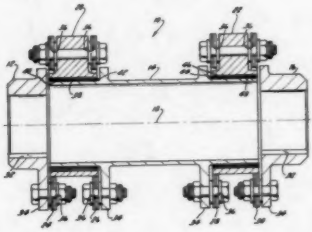
PILOTED FLEXIBLE COUPLING

Walter A. Fredericks, Warren, Pa., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Jan. 13, 1982, Ser. No. 339,024

Int. Cl.³ F16D *3/78, 3/50*

U.S. Cl. 464—99 **12 Claims**



1. A flexible torque transmission coupling, comprising:

a flexible disc having a central longitudinal axis and having a plurality of angularly-spaced, longitudinal apertures equidistant from said axis;

first and second rigid elements aligned along said axis, wherein said disc is alternately secured to said first and second rigid elements through said apertures so as to transmit torque between said rigid elements; and

cooperating means on said first and second rigid elements for eliminating angular misalignment between said first and second rigid elements while still permitting axial misalignment between them,

wherein said cooperating means comprises said first rigid element having a cylindrical outer surface portion and said second rigid element having a cylindrical inner surface portion, wherein said cylindrical outer surface fits into said cylindrical inner surface with a close sliding fit.

4,416,646

BICYCLE CHAIN-SHIFTING DEVICE

Eduard Bergles, Graz, Austria, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 10, 1981, Ser. No. 252,950

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013854

Int. Cl.³ F16H *7/22*; F16C *1/10*

U.S. Cl. 474—80 **13 Claims**

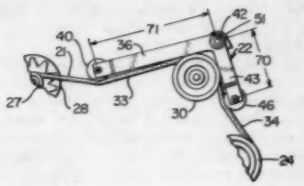
1. In a chain-shifting device for a bicycle or the like comprising a chain mover unit (17), a movable support member (21) supporting said chain mover unit (17), a fixed support member (23) to be attached to the frame of the bicycle, guide means (32,

34) supported on said fixed support member (23), said movable support member (21) being guided by said guide means (32, 34) from movement along a path of movement, first spring means (36) biasing said movable support member (21) towards one end of said path of movement (FIG. 3), an adjusting switch (30) including a switch housing (30*a*) and an operating member (30*b*) to be attached to a part of the bicycle, said operating member (30*b*) having a plurality of switch positions (12*a*–12*c*) with respect to said switch housing (30*a*), a terminal one (12*a*) of said switch positions (12*a*–12*c*) corresponding to said end of said path of movement and being defined by switch stop means, transmission means (27, 38, 40, 40*a*) extending between said operating member (30*b*) and said movable support member (21) for positioning said movable support member (21) along said path of movement by said operating member (30*b*) against the action of said first spring means (36), said transmission means (27, 38, 40, 40*a*) comprising a pulling member (28) and automatic compensating means for compensating for a change of the effective length of said transmission means so as to readjust in operation a predetermined position of said mover unit (17) when said operating member is in said terminal position (12*a*) and when a change of the effective length of the transmission means (27, 38, 40, 40*a*) has occurred, the improvement which consists in that said compensating means comprises a first compensating member (38) and a second compensating member (40) connected to a first section (28) and a second section (40*a*) of said transmission means respectively and rotatably mounted with respect to each other about an axis of rotation (34 *b*), a clamp roller free-wheel unit (42) being provided between said first and second compensating members (38, 40) such as to lock said compensating members (38, 40) with respect to each other in a first relative rotational direction for allowing transmission of a pulling force through said transmission means (27, 38, 40, 40*a*) and to allow relative rotation of said compensating members (38, 40) in a second rotational direction for compensating for a change of the effective length of said transmission means (27, 38, 40, 40*a*), and that a first abutment member (40*b*) is operationally connected to one (40) of said compensating members (38, 40) and a second abutment member (44) is operationally connected to a part (34) of said device which is movable with respect to said one compensating member (40) during movement of said movable support member (21) along said path of movement such that said abutment members (40*b*, 44) engage each other when said movable support member (21) approaches said one end of said path of movement, such engagement effecting relative rotation of said compensating members (38, 40) in said second rotational sense when a change of the effective length of said transmission means 27, 38, 40, 40*a*) has occurred.

4,416,647
BELT TENSIONER

Jack D. White, Jr., Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed May 26, 1981, Ser. No. 267,190
Int. Cl.³ F16H 7/12, 7/10
U.S. Cl. 474—134 15 Claims

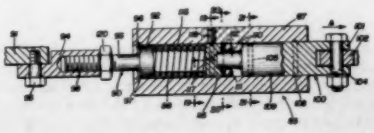


1. In the combination of a tensioner and an endless power transmission belt which is employed in driving a sheave comprising at least one accessory which upon being driven creates a slack side and a tight side in said belt on opposite sides of said sheave, said belt having an outside surface and an inside surface, said tensioner comprising, a first support arm having pivot means, a first idler pulley rotatably carried by said arm, and a pivot pin extending through said pivot means for pivotally supporting said first arm adjacent said sheave with said first pulley engaging said slack side of said belt on said outside surface thereof to enable tensioning thereof, a second support arm integrally formed with said first support arm, and supported by said pivot pin, a second idler pulley rotatably carried by said second arm and engaging said tight side of said belt on said outside surface thereof, and means connecting said second arm to said first arm to thereby move said first arm and its pulley into belt tensioning and dampening engagement against said slack side once said tight side of said belt moves said second pulley and second arm, said first arm being of extended length and having an inner end provided with said pivot means and said first pulley rotatably carried adjacent the outer end of said first arm, said second arm having an inner end and said second pulley rotatably carried adjacent the outer end of said second arm, said connecting means comprising means fixing said inner end of said second arm to said inner end of said first arm to define a substantially V-shaped unitary structure, the improvement wherein said first arm is longer than said second arm and said first pulley engages said slack side of said belt at a distance from said sheave greater than the distance said second pulley engages said tight side of said belt from said sheave whereby a greater amount of slack side tensioning than tight side tensioning is provided through the mechanical advantage of said first arm being longer than said second arm.

4,416,648
BELT TENSIONER

Mijo Radocaj, Massillon, Ohio, assignor to Dyneer Corporation, Canton, Ohio

Continuation-in-part of Ser. No. 224,468, Jan. 12, 1981, abandoned. This application Mar. 5, 1981, Ser. No. 240,822
Int. Cl.³ F16H 7/12
U.S. Cl. 474—135 6 Claims



1. A device for tensioning an endless drive belt of a vehicle

engine accessories drive system of the type in which bracket means is pivotally mounted on the engine with an idler pulley rotatably mounted thereon for tensioned engagement with the drive belt when the bracket means is moved in belt tensioning direction, and in which the device has a housing containing a spring biased shaft movable in the housing in belt tensioning direction, and in which a one-way clutch is provided restraining shaft movement in the other direction, wherein the improvement comprises:

(a) a tubular housing having first and second open ends and having a cylindrical bore therein extending between said open ends;

(b) a shaft having outer and inner ends including a main cylindrical body having a portion projecting out of said housing at said first housing end, and another portion which is slidably mounted within and movable in belt tensioning direction within said cylindrical bore, and the shaft also having an axially extending reduced diameter conical portion projecting within said bore from said body toward the second end of said housing to the inner shaft end;

(c) means pivotally connecting said outer shaft end with said bracket means;

(d) first spring means having inner and outer ends in said cylindrical bore located between the inner shaft end and the second open housing end;

(e) an end cap in said bore engaged between the inner end of said first spring means and said conical portion inner shaft end;

(f) tension adjusting means for said first spring means engaging said first spring means outer end within said cylindrical bore adjacent said second housing end and adapted to be pivotally mounted on said engine;

(g) one-way clutch means including spherical ball means located within said cylindrical bore between said end cap and said body for wedging engagement with said conical shaft portion; and

(h) second spring means operatively engaged with said ball means and end cap biasing said ball means into wedging engagement with said conical shaft portion;

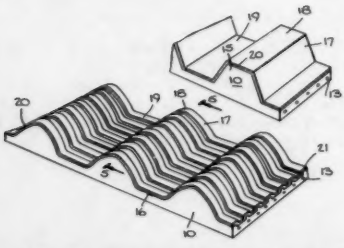
(i) whereby said first spring means biasing tension may be adjusted and said shaft body is biased for movement in belt tensioning direction.

4,416,649

REDUCED NOISE POSITIVE DRIVE POWER TRANSMISSION SYSTEM

Robert C. Kohrn, Bethany, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Sep. 14, 1979, Ser. No. 75,476
Int. Cl.³ F16G *5/20*
U.S. Cl. 474—153 **37 Claims**



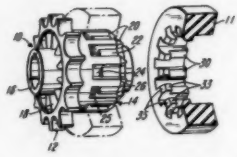
1. A positive drive power transmission system including a belt having a tensile member with a plurality of elastomer teeth secured to at least one side of the tensile member and extending along the tensile member, with each belt tooth having a flank portion and a tip portion, said flank portion of one tooth being spaced from the next consecutive flank portion of a next consecutive belt tooth by a belt land area, at least one of said flank portions including a first working surface area, and at least one toothed pulley having a plurality of pulley teeth which mesh with the belt teeth, with each pulley tooth having a second working surface area which makes impact contact with the first working surface area of the respective belt teeth when the belt and pulley are in meshing engagement, the belt and pulley generating an operating noise level at a given meshing frequency characteristic of the impact contact between the first and second working surface areas of the belt and the pulley, the improvement comprising a plurality of projections of predetermined size and shape formed on said first working surface areas to modify the impact contact between the first and second working surface areas by promoting a cushioning effect at the area of impact contact and thereby reduce the operating noise level of said power transmission system at the given meshing frequency.

4,416,650

DRIVE WHEEL AND SPROCKET ASSEMBLY

John J. Wilkins, Cincinnati, Ohio, assignor to The E.W. Buschman Company, Cincinnati, Ohio

Filed Jun. 26, 1981, Ser. No. 277,768
Int. Cl.³ F16H *55/30, 55/12*
U.S. Cl. 474—161 **9 Claims**



1. A drive wheel assembly comprising:

a hub of rigid material coaxially mounted about an axle sleeve

an annular body having an outer driving surface and an inner surface;

the inner surface of said body having thereon a plurality of radially inwardly extending and circumferentially space ribs integrally connected with said body over the entire length thereof,

means on said hub including an outside surface having thereon a plurality of grooves positioned to intermeash with said ribs to form a spline connection,

means on said hub forming a shoulder intersecting with each of said grooves, and

each of said ribs on said annular body including a tooth proportioned to hook over and interlock with said shoulder in the associated said groove in response to relative axial movement of said drive wheel and hub to the fully assembled relation thereof and thereby to secure said drive wheel axially on said hub,

said drive wheel being formed of a sufficiently resilient material for temporary compression of said teeth during assembly of said parts prior to expansion thereof into said locking relation with said shoulders.

4,416,651

ENVELOPE GUMMER CYLINDER CLUTCH AND BRAKE

John Sullivan, San Jose, and Harold R. Lillibridge, Burlingame, both of Calif., assignors to Champion International Corporation, Stamford, Conn.

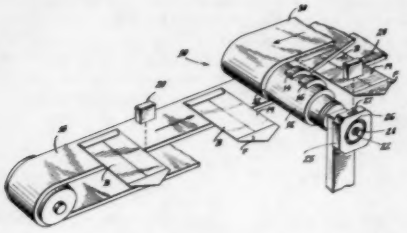
Filed Jul. 30, 1981, Ser. No. 288,522
Int. Cl.³ B31B *1/62*
U.S. Cl. 493—12 **11 Claims**

1. In an envelope forming apparatus, means for applying gum to spaced locations on an envelope blank comprising;

a gummer cylinder for applying gum to an envelope blank,

arcuate, spaced gummer pads for contact with an envelope

blank extending along the circumference of said gummer cylinder,
means for drivingly rotating said cylinder,
means for feeding an envelope blank beneath said gummer cylinder,
means for sensing an envelope blank on said feed means, and



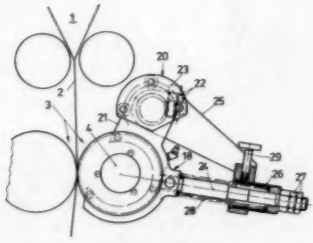
means for disconnecting said drive means from said cylinder and simultaneously stopping the rotation of said cylinder with the said spaced gummer pads in the twelve o'clock position in response to the failure of said sensing means to sense said envelope blank.

4,416,652

UNIT FOR SCORING WEBS OF PAPER IN THE LENGTHWAYS DIRECTION

Rudolf Fischer, Ludwigshafen-Oggersheim, and Rudolf Stab, Wachenheim, both of Fed. Rep. of Germany, assignors to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 284,611
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 3029091
Int. Cl.³ B26D *3/08*; B31B *1/25*
U.S. Cl. 493—399 **5 Claims**



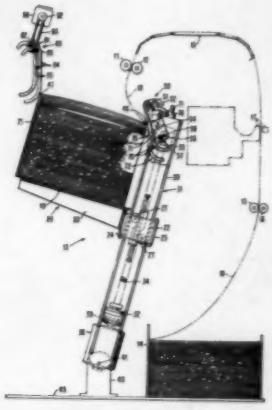
1. A scoring unit for the lengthwise scoring of a web of paper, comprising
first and second rolls for gripping two sides of said web and advancing said web, said first roll having a keyway running therealong;
means for driving at least one of said rolls; a collar mounted about said first roll and means allowing radial play between said collar and said first roll, said collar having a radial groove formed therein;
a sharp-edged wheel supported on said collar;
a back-up part disposed opposite to said sharp-edged wheel so as to cooperate therewith to score the web as it is fed therebetween;
coupling means for driving said collar from said first roll, comprising a driver ring mounted adjacent the collar and having a radial screw with an inner end functioning as a key by which it is keyed on said first roll allowing said driver ring to be keyed at a number of different positions along the first roll, and an axial pin extending from said ring for drivingly joining said ring with said collar, said pin being receivable in said radial groove in said collar, said collar being thereby permitted to float radially, and to be driven while out of round with respect to said first roll;
a support rod extending parallel to said rolls; and
a carriage slidably supported on said support rod and connected to the collar for adjusting the position of said collar and sharp-edged wheel along the first roll.

4,416,653

APPARATUS FOR STACKING FAN-FOLDED PAPER

Thomas A. Breski, Binghamton, N.Y., and Robert A. Ryan, deceased, late of Endwell, N.Y. (by The Bank of New York Inc., executor), assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,844
Int. Cl.³ B65H *45/00*
U.S. Cl. 493—412 **19 Claims**



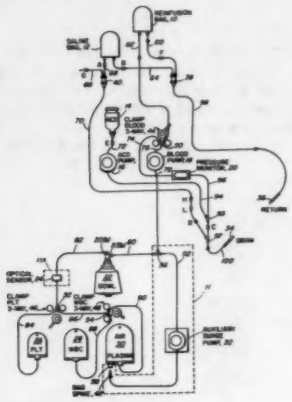
1. An apparatus for stacking a web of continous prefolded paper forms comprising
means for advancing said web in elongated form for refolding into a fan-folded stack,
stack support means for receiving said web from said advancing means and supporting said stack,
said stack support means being movable for adjusting the position of the uppermost edge formed by the uppermost layer of said stack relative to said means for advancing said web, and
a compacting mechanism for compressing said stack support means during folding of said web onto said stack inlcuding
a plurality of elongate rigid compacting elements vertically suspended along and to one side of said stack,
said compacting elements having a pivot connection above and a free end terminating below said uppermost layer of said stack,
said compacting elements having an active surface between said pivot connection and said free end facing said one side of said stack, and
means for imparting a downward stroke to said vertically suspended compacting elements whereby said active surface of said compacting elements is brought into sliding engagement with said uppermost edge of said stack then an upward stroke when said vertically suspended compacting elements are disengaged from said stack,
said compacting elements being freely pivotable at said pivot connection during said downward and upward strokes.

4,416,654

PHERESIS APPARATUS

Donald W. Schoendorfer, Brookline, and Lee E. Hansen, Wellesley, both of Mass., assignors to Haemonetics Corporation, Braintree, Mass.

Filed Sep. 3, 1981, Ser. No. 299,194
Int. Cl.³ B04B 11/00
U.S. Cl. 494—10 18 Claims



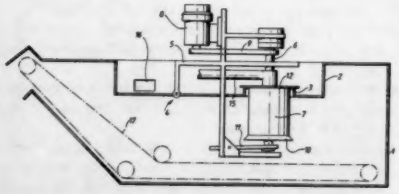
1. Apparatus comprising:
(a) a centrifuge;
(b) an enclosed fractionation volume on said centrifuge;
(c) an inlet and outlet port mounted on said centrifuge, the ports being in fluid communication with said fractionation volume;
(d) receptacle means outside said centrifuge for collecting a first fractionated whole blood component from said outlet port;
(e) pump means for (i) first causing whole blood to flow into said inlet port at a predetermined rate and (ii) secondly for causing a first fractionated component of whole blood to be recirculated to the inlet port of said centrifuge to elutriate the remaining contents in the fractionation volume.

4,416,655

CENTRIFUGES AND CENTRIFUGE CLEANING METHODS

Peter H. E. Bennett, East Grinstead, England, assignor to The Chartwell House Group Limited, England

Filed Jul. 27, 1981, Ser. No. 286,907
Claims priority, application European Pat. Off., Mar. 19, 1981, 81301180.6; United Kingdom, Jan. 19, 1981, 8101565
Int. Cl.³ B04B 11/08
U.S. Cl. 494—40 6 Claims



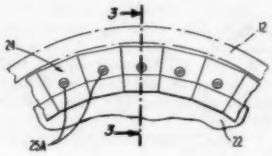
1. In a centrifuge comprising a drum, a drive system for rotating the drum, an inlet for supplying contaminated liquid to the drum, the drum having at least one orifice in its upper part to permit the discharge of filtered liquid; the improvement comprising an apertured lower end to the durm, a closure movable between a position in which said aperture is closed by the closure and a position in which the aperture is open, a cleaning member disposed within the drum for movement relative to the axis drum; means for effecting displacement of said closure into its position uncovering the aperture during a cleaning operation, and means for establishing relative movement between the cleaning member and the drum during such cleaning operation, said drum having a peripheral wall drivable continuously in rotation by the drive system, the lower end of said wall defining said aperture, said closure being constituted by a bottom wall movable parallel to the axis of the drum between a raised closed position and a lowered open position.

4,416,656

HARD SURFACING FOR A CENTRIFUGE CONVEYOR

Leonard Shapiro, Upper Darby, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 877,056, Feb. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 136,123, Mar. 31, 1980, Pat. No. 4,328,925. This application Apr. 6, 1982, Ser. No. 366,102
Int. Cl.³ B04B 1/20
U.S. Cl. 494—53 11 Claims



1. Improved hard surfacing for a helically formed, metal screw conveyor of a centrifuge, said conveyor extending in outward radial direction along a line between its rotational axis and its distal surface relative to said axis, said conveyor being rotatable transverse to said radial line about said axis, comprising:
a. a series of preformed backing member made of a metal which is weldable to said conveyor
b. a weld holding said backing member to said conveyor, with each backing member extending in radial direction substantially beyond the distal surface of said conveyor,
c. a preformed wear-resistant member, engaging its associated backing member at a contact surface between them which, in use, extends along a helical line about said axis generally following the distal edge of said conveyor,
d. said wear-resistant member having a distal portion extending in radial direction substantially beyond the distal surface of said conveyor, with said backing member disposed between said conveyor and said wear-resistant member, the distal portion of said wear-resistant member being braced by said conveyor through said backing member against deflection in axial direction towards said conveyor,
e. a passageway for each associated wear-resistant member and backing member, extending through at least one of said members to said contact surface between them,
f. and securing means extending through each passageway for securing each wear-resistant member to its associated backing member, thereby providing a unitary assembly of said members and holding said wear-resistant member against movement in radial direction,
g. said weld being accessible for unitarily replacing said assembly.

4,416,657

ABDOMINAL CATHETER IMPLANT

Rickey T. Berglund, 2275-68 Caminito Pescado, San Diego, Calif. 92107

Filed Aug. 13, 1982, Ser. No. 407,744
Int. Cl.³ A61M 25/00
U.S. Cl. 604—9 17 Claims

1. A catheter implantable in a living subject for supplying fluid to a first chamber in the body of the subject and controllably allowing fluid to pass from the first chamber into a second chamber of the subject, the catheter comprising:

a body adapted for implantation in the subject and having a proximal end and a distal end;

means for mounting said body in the subject with the proximal end adjacent to exterior of the subject and with the body extending into the interior of the subject;

said body having passage means therein leading from a location adjacent the proximal end into the interior of the body;

said passage means having inlet means adjacent said proximal end and outlet means communicating with said first chamber of the subject when the catheter is implanted in the subject whereby a fluid can be passed from the inlet means through the passage means and the outlet means to the first chamber; and

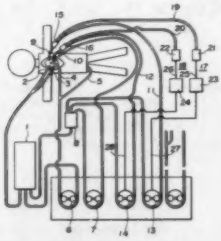
valve means on the body for controlling the flow of the fluid therethrough from the first chamber to the second chamber.

4,416,658

BLOOD SUCTION DEVICE

Masnaki Numazawa, Kamakura; Hidetaka Tashiro, Hadano, and Shuichi Ishii, Yokohama, all of Japan, assignors to Senko Medical Instrument Mfg. Co., Tokyo, Japan

Filed Oct. 22, 1981, Ser. No. 314,027
Claims priority, application Japan, Oct. 30, 1980, 55-152867; Oct. 30, 1980, 55-155577
Int. Cl.³ A61M 31/00
U.S. Cl. 604—48 4 Claims



1. A blood suction device for removing blood from a surgical field comprising:

a suction tip of a type used in cardiotomy operations made of a tubular member forming a blood conduit along the entire length thereof for sucking the blood;

a pumping tube communicating at one end thereof with said suction tip and at the other end thereof with a blood reservoir;

a roller pump of a type used in cardiotomy operations driven by a motor and positioned between said one and the other end of said pumping tube for acting thereupon to convey the blood from said suction tip to said reservoir;

pressure sensing means mounted on said suction tip for sensing a pressure exerted thereon, said pressure sensing means having an outlet to which one end of a pressure conduit is connected; and

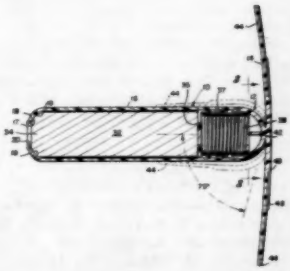
control means positioned remotely from said suction tip for converting said sensed pressure at the other end of said pressure conduit into an electrical signal and generating a control signal for driving said motor, said control signal causing said motor to revolve at an increased or decreassed revolution rate in response to said sensed pressure, and when no pressure is sensed with said pressure sensing means, to revolve at a predetermined revolution rate including zero revolution.

4,416,659

SUSTAINED RELEASE CAPSULE FOR RUMINANTS

Barbara E. Simpson, Indianapolis, Ind., and Norman A. Gervais, Hardy, Va., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 9, 1981, Ser. No. 319,183
Int. Cl.³ A61M 7/00
U.S. Cl. 604—48 13 Claims



1. A sustained release capsule adapted to be retained in the rumen of a ruminant animal for delivery of an administrative composition thereto over a prolonged period, comprising

an elongated tubular body containing an administrative composition and including a delivery area for delivery of such composition to the rumen,

retention arms attached to the body for retaining the capsule in the rumen, said arms being attached to the capsule body at junctions spaced inward from the sides of the body and having resiliently bendable portions extending from such junctures outward to such sides, and the body having curved surfaces along which such arm portions may bend, said arms normally standing outward from the body and being bendable along such curved surfaces so as to be moved from such normal outstanding positions to administration positions along the sides of the body for passage through the esophagus into the rumen of the animal and being adapted to resiliently return to their normal outstanding positions in the rumen.

4,416,660

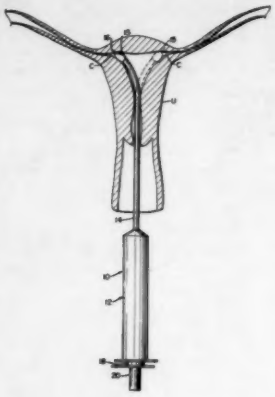
METHOD OF TRANSVAGINAL STERILIZATION

Charles A. Dafoe, 725 Republic Bldg., Denver, Colo. 80202

Continuation of Ser. No. 594,269, Jul. 9, 1975, Pat. No. 4,136,695. This application May 2, 1978, Ser. No. 902,159

Int. Cl.³ A61M *1/00*

U.S. Cl. 604—55 3 Claims



1. The method of transcervical sterilization of females comprising the steps of:

(a) blindly inserting a plurality of needles into the uterus for a distance to penetrate the body tissue at one of the cornul portions on one side of the uterus;

(b) injecting a sclerosing agent composed of paraformaldehyde in an alcohol solution through the needles into the body tissue from a point externally of the uterus in a concentration sufficient to occlude the cornul portion on the one side of the uterus;

(c) withdrawing the needles from the tissue and relocating them in the body tissue of the opposite cornul portion and injecting a predetermined amount of said sclerosing agent therethrough and into the body tissue at that point; and

(d) withdrawing the needles from the uterus.

4,416,661

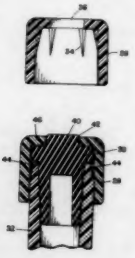
INJECTION SITE FOR FLUIDS

Melvin H. Norman, Oakland; Reinhold R. Manske, Hayward, and Neil J. Sheehan, Berkeley, all of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Dec. 24, 1981, Ser. No. 334,277

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—86 8 Claims



1. An injection site device for a parenteral fluid administration system, comprising a generally tubular injection port having an outlet, an inlet end and a bore; an elastomeric plug, a portion of which extends within the bore of the inlet conforming generally to the bore, the plug having an annular outwardly extending flange which generally covers the end of the inlet; and a cap member having a top portion having a central aperture and a skirt portion having an inner wall fitting around and generally conforming to a portion of the outer wall of the port inlet, the cap skirt including a plurality of longitudinal projections beginning at about the top portion of the inner wall of the skirt and tapering in a downwardly direction, the cap member compressingly engaging the flange of the plug by means of a bond between at least a portion of the longitudinal projections on inner wall of the skirt of the cap and the outer wall of the port, the engagement resulting in projection of at least a portion of the top of the plug through the aperture of the cap member.

4,416,662

ROLLER INFUSION APPARATUS

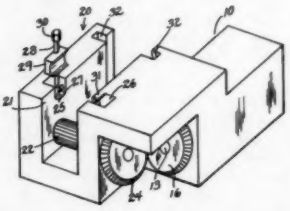
Charles F. G. Dore, Harrow, and Geoffrey R. Chambers, Northwood, both of England, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jun. 8, 1981, Ser. No. 271,271

Claims priority, application United Kingdom, Jun. 13, 1980, 8019431

Int. Cl.³ A61M *37/00*

U.S. Cl. 604—154 25 Claims



12. A powered medicinal infuser apparatus for infusing medicinals over long periods in a continuous manner comprising a housing carrying a toothed roller means, means for holding a disposable plastic syringe having a smoothly profiled plunger in predetermined disposition to said housing with said plunger extending transversely to the axis of rotation of and in driving penetrating engagement with said toothed roller, a motor for driving said toothed roller means, and a transmission operably coupling said motor and toothed roller means.

4,416,663

SELF-STERILIZING HYPODERMIC SYRINGE

Robert M. Hall, Capetown, South Africa, assignor to Steri-Pac, Inc., Pittsburgh, Pa.

Filed Oct. 26, 1981, Ser. No. 314,766

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—163 6 Claims

1. A self-sterilizing hypodermic syringe for repeated use in veterinary applications or the like comprising, a hypodermic syringe including a tubular hypodermic needle fitted at one end with fluid pressure means to eject or draw fluid through said hypodermic needle, the improvement comprising a cap-

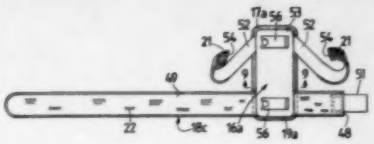
sule containing sterilizing fluid and having perforative ends of flexible material with elastic memory tendencies for self sealing after axial perforation by the forward end of said needle, said capsule coaxially and slidably received over the forward end of said needle with the forward exposed portion of said needle slidably penetrating one end of said capsule in perforation and lodged in said sterilizing fluid, capsule guide means slidably guiding said capsule for axial movement on said needle when axial force is applied against the other end of said capsule to cause said exposed end of said needle to penetrate said other outer end of said capsule for hypodermic penetration, said capsule guide means including a rigid tubular guide sleeve coaxially received over said hypodermic needle with clearance, one end of said tubular guide sleeve removably secured to said syringe with a portion of the free forward end of said needle exposed beyond the other end of said tubular guide sleeve for hypodermic penetration, said capsule slidably receivable in said tubular guide sleeve for guided axial movement, and spring means for axially urging and positioning said capsule outward to its original position of rest, such that said exposed end portion of said needle is again enclosed in said capsule for sterilization when said force is removed.

4,416,664

CATHETER SECURING DEVICE

Charles E. Womack, 2122 Helton Dr., Florence, Ala. 35630

Filed Sep. 11, 1981, Ser. No. 301,451
Int. Cl.³ A61M 5/32
U.S. Cl. 604—174 **4 Claims**



1. A device for securing a catheter or the like to a leg of a person comprising:

(a) a supporting pad-like member adapted to extend alongside and contact said leg of a person,

(b) at least one flexible strap secured to said pad-like member adjacent one end portion thereof and extending laterally therefrom in position to encircle said leg of the person,

(c) means detachably connecting said strap about said leg of the person,

(d) means carried by said pad-like member for detachably connecting a catheter thereto and restraining longitudinal movement thereto, and

(e) a pair of additional flexible straps secured to and extending diagonally from the other end portion of said pad-like member toward said one flexible strap with connector means detachably connecting end portions of said additional flexible straps to the outer surface of said one flexible strap.

4,416,665
WATER-INSOLUBLE AZO DYESTUFF, FOR DISCHARGE PRINTING

Horst Tappe, Dietzenbach, and Kurt Roth, Hofheim, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

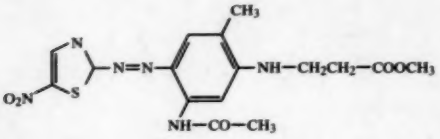
Filed Sep. 21, 1981, Ser. No. 303,852

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1980, 3036576

Int. Cl.³ C09B *29/04*; D06P *5/17*

U.S. Cl. 8—464 **2 Claims**

1. In the process for printing hydrophobic fiber materials by the discharge printing process using an azo dyestuff, the improvement comprises said azo dyestuff being the water-insoluble dyestuff of the formula



the dyestuff.

4,416,666
COAL-WATER SLURRY AND METHOD FOR ITS PREPARATION

James E. Funk, Alfred Station, N.Y., assignor to Alfred University Research Foundation Inc., Alfred, N.Y.

Continuation-in-part of Ser. No. 88,815, Oct. 26, 1979, Pat. No. 4,282,006, which is a continuation-in-part of Ser. No. 957,166, Nov. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,337, Apr. 25, 1977, abandoned. This application Jul. 31, 1981, Ser. No. 288,737

The portion of the term of this patent subsequent to Aug. 4, 1998, has been disclaimed.

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 **59 Claims**

1. A stable deashed coal-water slurry containing from about 65 to about 85 percent of solids by weight of slurry, from about 15 to about 35 percent of carrier water by weight of slurry, from about 0 to about 14 weight percent of ash by weight of solids, and from about 0.01 to about 4.0 weight percent of dispersing agent by weight of dry coal, wherein:

(a) said coal-water slurry has a Brookfield viscosity of less than 4,000 centipoise when tested at a solids content of 75 weight percent, ambient temperature, and 60 revolutions per minute;

(b) said coal-water slurry has a yield stress of from about 0.1 to about 10 Pascals;

(c) the viscosity of said coal-water slurry decreases at a constant shear rate with time, decreases at an increasing shear rate, and decreases at an increasing temperature;

(d) said coal-water slurry comprises a compact of finely-divided particles of coal dispersed in said carrier water;

(e) at least about 85 weight percent of the particles of coal in said coal-water slurry have a particle size less than 300 microns;

(f) no more than 0.5 weight percent of the particles of coal in said slurry have a particle size less than 0.05 microns;

(g) from about 5 to about 36 weight percent of the particles of coal in said slurry are of colloidal size, being smaller than about 3 microns, and said colloidal sized particles of coal have a net zeta potential in said coal-water slurry of from about 15 to about 85 millivolts; and

(h) said compact of finely divided particles of coal has a particle size distribution substantially in accordance with the following formula:

$$CPFT = \frac{D^n - D_S^n}{D_L^n - D_S^n} \cdot 100,$$

where

CPFT = cumulative weight percent, dry basis, of particles finer than a particle of stated size, D,

D = diameter of any particle in the compact,

D_L = diameter of largest particle in compact, sieve size or its equivalent, being from about 38 to about 400 microns,

D_S = diameter of smallest particle in compact, being from about 0.01 to about 0.4 microns, and

n = numerical exponent, with n being from about 0.2 to about 0.5 and with all diameters sized in microns.

4,416,667
METHANOL, ETHANOL, OR GASOHOL FUEL CONTAINING AS A WEAR-INHIBITING ADDITIVE A REACTION PRODUCT OF AN ETHER-AMINE WITH A PHOSPHATE OR A SUBSTITUTED PHOSPHONIC ACID

Benjamin J. Kaufman, Wappingers Falls; Rodney L. Sung, Fishkill, and William M. Sweeney, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,156

Int. Cl.³ C10L *1/26*

U.S. Cl. 44—56 **37 Claims**

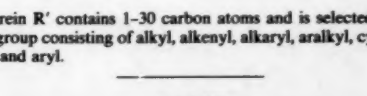
1. A fuel composition for internal combustion engines comprising:

(a) a major portion of a fuel containing (i) at least one alcohol selected from the group consisting of ethanol and methanol and (ii) gasoline in amount of 0–50 volumes per volume of alcohol; and

(b) a minor wear-inhibiting amount, 0.2–3 w %, of, as a wear-inhibiting additive, a reaction product of

(i) an amine having the formula $(ROR'')_a\text{-}NH_{3-a}$ wherein R contains 1–30 carbon atoms and is selected from the group consisting of alkyl, alkenyl, alkaryl, aralkyl, cycloalkyl, and aryl groups and R'' is a divalent hydrocarbon group containing 1–30 carbon atoms and is selected from the group consisting of alkylene, alkenylene, alkarylene, aralkylene, cycloalkylene, and arylene groups, and a is an integer 1–3 with

(ii) a phosphonic acid



wherein R' contains 1–30 carbon atoms and is selected from the group consisting of alkyl, alkenyl, alkaryl, aralkyl, cycloalkyl, and aryl.

4,416,668
ANTISTATIC AGENTS FOR ORGANIC LIQUIDS

Neil E. S. Thompson, Creve Coeur, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 954,512, Oct. 25, 1978. This application Jun. 4, 1982, Ser. No. 385,179

Int. Cl.³ C10L *1/22*, *1/24*

U.S. Cl. 44—62 **6 Claims**

1. An antistatic composition comprising an organic fluid containing an antistatic amount, in the concentration of 1 to 10 parts per million, of an antistatic agent consisting of (1) a polymer containing α-olefin units selected from the group consisting of 1-decene, 1-dodecene, 1-tetradecene and 1-octadecene units and maleimide units and (2) a 1-decene-SO_2 copolymer, the ratio of maleimide copolymer to SO_2 copolymer being 100:1 to 1:100.

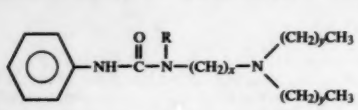
4,416,669

FUEL AND LUBRICANT COMPOSITIONS FOR OCTANE REQUIREMENT REDUCTION

L. B. Graiff, Houston; Z. L. Murphy, Cypress, both of Tex., and J. A. N. Scott, Hillegom ZH, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 22, 1982, Ser. No. 350,668
Int. Cl.³ C10L 1/22
U.S. Cl. 44—71 6 Claims

1. A gasoline boiling range hydrocarbon fuel composition incorporating a minor amount of an additive composition which is both highly polar and soluble in hydrocarbons and yet relatively insoluble in water and which exhibits octane requirement reduction properties, said additive composition comprising a class of substituted ureas represented by the formula:



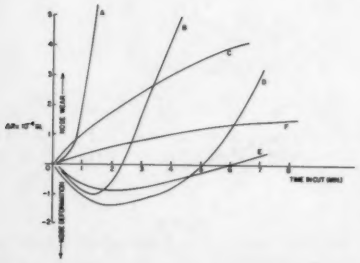
in which X has a value from one to four, Y has a value from zero to three, and R is hydrogen or a hydrocarbyl radical having from one to three carbon atoms.

4,416,670

CARBIDE COATED COMPOSITE SILICON NITRIDE CUTTING TOOLS

Vinod K. Sarin, Lexington; Sergej-Tomislav Buljan, Acton, and Charles D'Angelo, Southboro, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 20, 1982, Ser. No. 380,362
Int. Cl.³ B24D 11/00
U.S. Cl. 51—295 15 Claims



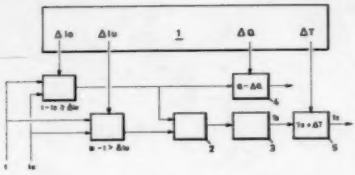
1. A coated composite ceramic cutting tool comprising a composite silicon nitride substrate body having at least one adherent coating layer; said substrate body consisting essentially of particles of a hard refractory material uniformly distributed in a matrix consisting essentially of a first phase of silicon nitride and a refractory second phase comprising silicon nitride and an effective amount of a metal oxide densification aid selected from the group consisting of yttrium oxide, magnesium oxide, zirconium oxide, hafnium oxide, the lanthanide rare earth oxides, and mixtures thereof; said adherent coating layer consisting essentially of a material selected from the refractory metal carbides.

4,416,671

METHOD OF OPTIMIZING THE COLLECTION EFFICIENCY OF AN ELECTROSTATIC PRECIPITATOR

Wenzel von Jordan, Darmstadt, and Franz Neulinger, Dietzenbach, both of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 5, 1982, Ser. No. 355,038
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1981, 3108968
Int. Cl.³ B03C 3/00
U.S. Cl. 55—4 6 Claims



1. A method of optimizing the collection efficiency of a dry-process electrostatic precipitator which is preceded by an evaporative cooler, wherein liquid is sprayed into the evaporative cooler at a rate Q which is controllable to maintain a desired temperature T_c of an acid containing flue gas stream which is passed through the evaporative cooler and electrostatic precipitator, comprising the steps of:

(a) intermittently measuring the acid dew point T_s of the flue gas stream downstream of the evaporative cooler and setting the desired temperature T_c in dependence on the measured acid dew point T_s and a preselected margin of safety ΔT, in accordance with $T_c = T_s + \Delta T$,

(b) determining a desired input current I_c for the electrostatic precipitator at the temperature T_c and storing I_c, and

(c) continuously obtaining the deviations of the actual input current I of the precipitator from the desired input current I_c and initiating the measurement of the acid dew point T_s in response to a predetermined deviation ΔI to update the desired temperature T_c.

4,416,672

DEGASSER

Gene E. Underwood, 3915 Placid Dr., Casper, Wyo. 82601

Continuation of Ser. No. 170,018, Jul. 18, 1980, abandoned. This application Feb. 19, 1982, Ser. No. 350,255
Int. Cl.³ B01D 19/00
U.S. Cl. 55—190 34 Claims

1. Apparatus for removing gas from a fluid, comprising:

a housing comprising wall structure defining a chamber having a central axis extending between first and second ends of said housing,

inlet means in fluid communication with said chamber, located at said first end of said housing for receiving fluid to be processed,

a plurality of blade means located in said chamber for rotation about said central axis,

said blade means being angularly spaced around said axis,

means for rotating said blade means for spinning the fluid received through said inlet means, against the inside surface of the wall of said housing as a thin layer and moving said fluid as a thin layer to the end of said chamber opposite said inlet means for allowing the gas in said fluid to separate from said fluid,

gas outlet means at said end of said chamber opposite said inlet means and spaced radially outward from said axis for withdrawing the gas separated from said fluid and,

fluid outlet means at said end of said chamber opposite said inlet means,

said fluid outlet means being spaced radially outward from said

axis and radially outward from said gas outlet means for withdrawing the fluid from which the gas has separated.

25. Apparatus for removing gas from a fluid comprising:

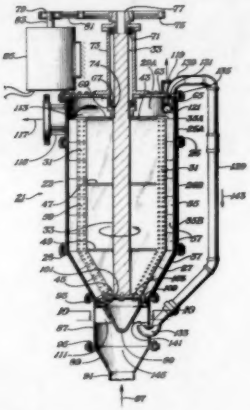
a housing comprising wall structure defining a chamber having a central axis extending between first and second ends of said housing,

inlet means located at said first end of said housing for receiving fluid to be processed,

a plurality of blade means located in said chamber for rotation about the central axis of said housing,

said blade means being angularly spaced around said axis,

means for rotating said blade means for spinning the fluid received through said inlet means against the inside surface of the wall of said housing as a thin layer and moving said



fluid as a thin layer to the end of said chamber opposite said inlet means for allowing the gas in said fluid to separate from said fluid,

gas outlet means at said end of said chamber opposite said inlet means for withdrawing the gas separated from said fluid,

fluid outlet means at said end of said chamber opposite said inlet means for withdrawing fluid from which the gas has separated, and

conduit means having one end at said end of said chamber opposite said inlet means and an opposite end in fluid communication with said inlet means for flowing fluid from said end of said chamber opposite said inlet means, to said inlet means for controlling the thickness of the layer of fluid on the inside surface of the wall of said housing and for preventing said fluid from flowing through said gas outlet means.

4,416,673

DUST COLLECTOR FOR FURNACE CHARGING INSTALLATION

Michel Kirchen; Marc Solvi, both of Luxembourg, and Clement Burton, Esch s/Alzette, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Feb. 19, 1982, Ser. No. 350,253

Claims priority, application Luxembourg, Feb. 23, 1981, 83.161

Int. Cl.³ B01D *45/00*

U.S. Cl. 55—267 **5 Claims**

1. Apparatus for separating particulate matter from a stream of pressurized dust-laden gas, the gas to be passed through the separating apparatus being discharged from an intermediate storage hopper of a furnace charging installation, the hopper being provided with a steeply rising gas discharge conduit which has a pressure equalization valve associated therewith, comprising:

a plurality of perforated discs;

means supporting said perforated discs in a parallel spaced apart relationships in the gas stream, said supporting means orienating said discs at an oblique angle with respect to the horizontal;

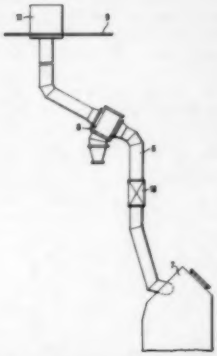
means positioned below said discs for collecting particulate matter separated from the gas stream; and

an extension of said hopper discharge conduit, said conduit extension being oriented at an angle with respect to said discharge conduit, said supporting means being positioned in said conduit extension;

said support means comprising:

a generally saddle-shaped suspension member;

means for removably attaching a first end of said suspension member to said conduit extension;



means for mounting said perforated discs from said saddle-shaped member, said mounting means including removable fasteners which engage said saddle-shaped member and said discs, said mounting means further comprising spacers for maintaining the desired axial displacement between said discs; and

means for removably attaching the one of said discs displaced the farthest from said saddle-shaped member to said conduit extension whereby said attaching means and saddle-shaped member define a coaxial portion of said conduit extension.

4,416,674

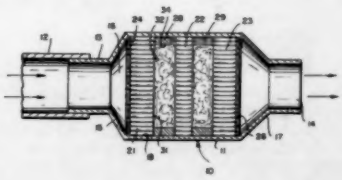
FILTER FOR TREATING A PARTICLE-CARRYING GASEOUS STREAM

Matthew A. McMahon, Wappingers Falls; Raymond F. Wilson; King D. Eng, both of Fishkill, and Robert B. Burns, Huntington, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 200,754, Oct. 27, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,707

Int. Cl.³ B01D *50/00, 39/20;* F01N *3/28*

U.S. Cl. 55—485 **2 Claims**



1. Apparatus for removing particulate matter from a hot gaseous stream which comprises;

a casing **11** having an inner wall which defines an elongated filter chamber **18**,

inlet **13** and outlet **14** means communicating with said filter chamber **18** to conduct said hot gaseous stream therethrough,

a plurality of adjacently positioned rigid filter beds **21**, **22**, **23**, fixedly disposed within said filter chamber **18**, and each comprising a disc-like, monolith structured, ceramic member extending transversely of said filter chamber **18**, the respective filter beds being spaced apart to define a turbulation chamber **31** therebetween,

a spacer ring **28** disposed within said turbulation chamber defining the periphery thereof, and being in abutting engagement with disc-like ceramic members,

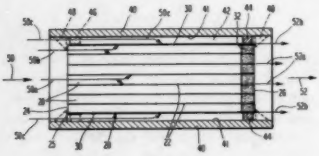
a gas pervious, non-rigid filter media mass comprised of randomly disposed fibrils being positioned in said turbulation chamber so as to substantially fill said turbulation chamber, at least a segment of said fibrils being disposed adjacent to the spacer ring **28** and being compressibly retained between the abuttingly engaged spacer ring and said disc-like ceramic members.

4,416,675

HIGH CAPACITY SOLID PARTICULATE FILTER APPARATUS

Max R. Montierth, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,993
Int. Cl.³ B01D *39/20*
U.S. Cl. 55—502 **12 Claims**



1. In an apparatus for removing solid particulates from fluids, a filter of honeycomb structure comprising:

a matrix of thin porous interconnected walls defining an open inlet end face and an opposing outlet end face of the filter and a multiplicity of cells extending substantially longitudinally between the inlet and outlet end faces, all of the cells being open at the inlet end face and closed near the outlet end face,

the thin walls having interconnected open porosity of a volume and size sufficient to enable fluid to enter and flow within the thin walls to and through the outlet end face of the filter and to prevent at least a significant portion of the solid particulates in the fluid from flowing through the thin walls to and through the outlet end face of the filter.

4,416,676

HONEYCOMB FILTER AND METHOD OF MAKING IT

Max R. Montierth, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,994
Int. Cl.³ B01D *39/20*
U.S. Cl. 55—523 **23 Claims**

1. A filter for removing solid particulates from fluids passed therethrough comprising:

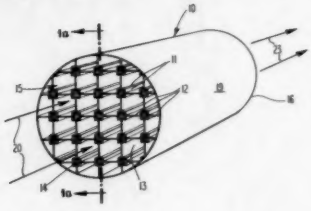
a multiplicity of interconnected thin porous walls forming a matrix defining at least one inlet end face and at least one outlet end face of the filter and a multiplicity of cells each extending through the filter from at least one of the inlet or outlet end faces,

an inlet group of the cells each open only at said at least one inlet end face,

an outlet group of the cells each open only at said at least one outlet end face of the filter,

a first subset of the thin walls having a first uniform thickness, each first subset thin wall being shared in common by one of the outlet cells and one or more of the inlet cells adjoining the outlet cell and having an interconnected open porosity of a size and volume sufficient to allow the fluid to flow completely across the first uniform thickness of the first subset of thin walls while preventing at least a significant portion of the solid particulates in the fluid from passing completely across the first subset of thin walls,

a second subset of the thin walls having a second uniform thickness, each second subset thin wall interconnecting with at least one thin wall of the first subset and forming a common wall between a pair of adjoining inlet cells and having an interconnected open porosity of a size and volume sufficient to allow fluid to flow completely through the longer dimensions of each of the second subset thin walls to the interconnected thin wall of the first subset and to prevent at least a significant portion of the solid particulates from passing either completely across or through the second subset of thin walls in any direction, and



said first uniform thickness differing from said second uniform thickness.

20. In a method of fabricating a filter of honeycomb structure for removing solid particulates from fluids passed through the filter comprising the steps of (a) providing a matrix of thin brittle interconnected porous walls defining an inlet end face and outlet end face on opposite sides of the filter and a multiplicity of cells extending between the inlet and outlet faces and through the filter and further having interconnected open porosity of a size and volume sufficient to enable fluid to flow completely across the thickness of the thin walls and to restrict at least a significant portion of the solid particulates from flowing either completely across or through the thin walls in any direction, (b) forming an inlet group of cells open at the inlet end face and closed at the outlet end face and an outlet group of cells open at the outlet end face and closed near the inlet end face, a first subset of the thin walls being shared in common by adjoining inlet and outlet cells and a second subset of the thin walls being shared in common by pairs of adjoining inlet cells, the improvement comprising the step of intersecting in a substantially perpendicular fashion each of the thin walls of the first subset with a thin wall of the second subset whereby a flexing joint is formed therebetween.

4,416,677

SPLIT SHELF VAPOR AIR SEPARATION PROCESS

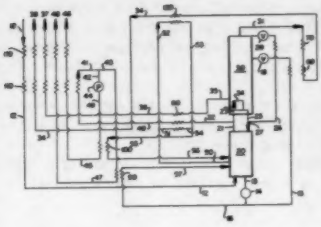
Ravindra F. Pahade, North Tonawanda, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 25, 1982, Ser. No. 381,844
Int. Cl.³ F25J *5/00*
U.S. Cl. 62—13 **13 Claims**

1. In a process for the separation of air by rectification wherein gaseous feed air at greater than atmospheric pressure and substantially free of water and carbon dioxide is introduced into a high pressure column operating at a pressure of

from about 80 to 180 psia where said feed air is separated by rectification into a nitrogen-rich fraction and an oxygen-enriched fraction, and wherein a portion of said nitrogen-rich fraction is removed from said high pressure column and warmed by indirect heat exchange with said feed air by partial traverse of a reversing heat exchange zone, said portion being sufficient to maintain self-cleaning of the reversing heat exchange zone, the improvement comprising:

(A) warming said portion comprising from about 10 to 18 percent of the feed air flow;



(B) dividing the warmed portion into a first part comprising from about 50 to 90 percent of said warmed portion and a second part comprising from about 10 to 50 percent of said warmed portion;

(C) expanding said first part to a pressure of from about 15 to 35 psia;

(D) warming the expanded first part by passage through said reversing heat exchange zone;

(E) removing from said process said first part as nitrogen-rich gas; and

(F) directly recovering said second part as high pressure nitrogen-rich gas.

4,416,678

METHOD AND APPARATUS FOR MAKING GLASS FILAMENT OR FIBERS

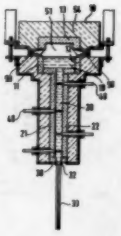
Diether Böttger, Hochheim, Fed. Rep. of Germany, assignor to Eglasstrek Patent Promotion & Awarding GmbH, Hochheim, Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 318,319

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111484

Int. Cl.³ C03B *37/09, 37/025*

U.S. Cl. 65—2 **6 Claims**



6. A method of producing glass filaments which comprises the steps of:

heating a stream of molten glass while passing it horizontally through a forehearth;

diverting glass from said stream downwardly through intermediate chambers of elongated cross section between pairs of closely juxtaposed walls of said chambers in substantially laminer streams;

heating the glass of each of said streams within said chambers by passing an electric current directly through the glass of said streams between electrodes projecting from at least one of the walls of each chamber into the respective glass stream and extending toward the other wall of the respective chamber; and

extruding filaments from each of said streams through an orifice of a nozzle plate at the bottom end of each of said chamber.

4,416,679

TRANSPORT SYSTEM FOR HEATED GLASS PANES AND METHOD OF TRANSPORTING GLASS PANES

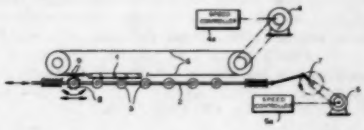
Horst Frielingsdorf, Am Meisenhort 2, 5630 Remscheid, 11, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,129

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1981, 3113410

Int. Cl.³ C03B *35/18*

U.S. Cl. 65—118 **7 Claims**



1. In a glass-treatment apparatus in which glass bodies are displaced through a thermal treatment station, a glass-carrying conveyor system for carrying said bodies without sagging which coprises:

a roller conveyor formed with a plurality of rollers reciprocating said body and having radii R in contact therewith;

means for imparting a linear reciprocation $V_{grate(osc)}$ to said conveyor;

means for imparting to said rollers an angular velocity component ω_{trans} in one sense, thereby contributing a linear velocity component $R \cdot \omega_{trans}$ to a pane supported thereby; and

means for imparting an angular oscillation ω_{osc} to said rollers for contributing an oscillatory component $R \cdot \omega_{osc}$ to said panes whereby the relative displacement of said glass body and said roller conveyor is $R \cdot \omega_{osc} + R \cdot \omega_{trans}$, each of said rollers being provided at an end thereof with a respective sprocket wheel and said sprocket wheels mesh with a common pass of an endless chain.

5. A method of passing a hot glass pane through a treatment station without sagging of the pane which comprises the steps of:

(a) supporting said pane on a roller grate in said treatment station;

(b) imparting the linear reciprocating $V_{grate(osc)}$ to said grate while said pane is supported by said grate and traverses said station;

(c) imparting to the rollers of said grate an angular velocity component ω_{trans} in a direction such that said component displaces said pane continuously through said station, said rollers having a radius R where they engage said pane; and

(d) imparting an angular velocity oscillation ω_{osc} to said rollers whereby said pane is displaced relative to said grate at a velocity corresponding to $R \cdot \omega_{osc} + R \cdot \omega_{trans}$, rotation being imparted to said rollers by causing a sprocket wheel at an end of each of said rollers to mesh with a common pass of a drive chain.

7. In an apparatus for the manipulation of glass panes at a temperature which might cause said pane to sag between two supported locations, wherein a roller grate having a multiplicity of mutually parallel transversely spaced rollers is journaled on said grate and are driven by an endless roller drive element, and wherein the grate is connected to a reciprocating grate

drive, the improvement which comprises in combination therewith:

respective sprocket wheels formed on each of said rollers at one end thereof;

a common pass of an endless drive chain engaging each of said sprocket wheels for rotating them in the same sense, said chain forming said element and being driven so that said pass move in the direction of displacement of said panes on said grate, said pass having a speed proportional to a linear velocity component imparted to said pane by said roller in said direction; and

means for linearly reciprocating said grate with a linear reciprocation which is superimposed on the rotation imparted to said rollers that said rollers engage said pane with a back-and-forth angular oscillation, the latter means including a crank drive.

4,416,680

METHOD OF MAKING QUARTZ GLASS CRUCIBLES, AND APPARATUS CARRYING OUT THE METHOD

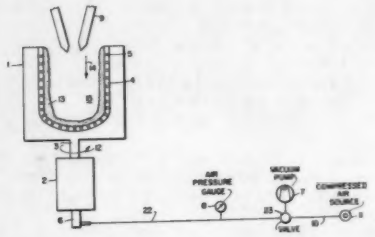
Rolf Brüning, Bruchköbel, and Friedhelm Habegger, Hammersbach, both of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed Mar. 25, 1981, Ser. No. 247,394

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014311

Int. Cl.³ C03P *19/04*

U.S. Cl. 65—144 **11 Claims**



1. Apparatus to manufacture crucibles made of quartz glass from granular particles of quartz, said crucibles being capable of being used in the manufacture of single-crystal silicon blanks for electronic semiconductor applications, said apparatus comprising

a gas-tight housing (1);

a hollow mold (4) having a bottom wall portion and a side wall portion and defining a hollow space therein, made of a material which does not react with heated quartz, inserted in said housing and gas-tight with respect thereto, leaving a space between the mold and the housing open to ambient air;

means (2, 3) for rotatably supporting said housing (1) and said mold (4) therein to rotate said housing and said mold about a vertical axis;

and heating means located with respect to said mold such that it is introducible into the hollow space of the hollow mold (4);

wherein

the hollow mold comprises:

a metallic mold body formed with fine bores (5) through the walls thereof in both the bottom and side wall portions to form gas-pervious walls;

and vacuum pump means (7) for furnishing a vacuum are provided, the vacuum being connectable to the space defined between the gas-tight housing and the hollow mold such that a vacuum can be applied through the gas-pervious walls of said hollow mold to draw the quartz particles against the walls and remove air as the particles first sinter and then fuse and melt under the influence of heat supplied by the heater means in the hollow space of the mold.

6. Apparatus to manufacture crucibles made of quartz glass from granular particles of quartz, said crucibles being capable of being used in the manufacture of single-crystal silicon blanks for electronic semiconductor applications, said apparatus comprising

a gas-tight housing (1);

a hollow mold (4) having a bottom wall portion and a side wall portion and defining a hollow space therein, made of a material which does not react with heated quartz, inserted in said housing and gas-tight with respect thereto, leaving a space between the mold and the housing open to ambient air;

means (2, 3) for rotatably supporting said housing (1) and said mold (4) therein to rotate said housing and said mold about a vertical axis;

and heating means located with respect to said mold such that it is introducible into the hollow space of the hollow mold (4);

wherein

the hollow mold comprises:

a sintered metallic porous body which is porous to the extent that it is gas-pervious throughout its side and bottom walls;

and vacuum pump means (7) for furnishing a vacuum are provided, the vacuum being connectable to the space defined between the gas-tight housing and the hollow mold such that a vacuum can be applied through the gas-pervious walls of said hollow mold to draw the quartz particles against the walls and remove air as the particles first sinter and then fuse and melt under the influence of heat supplied by the heater means in the hollow space of the mold.

4,416,681

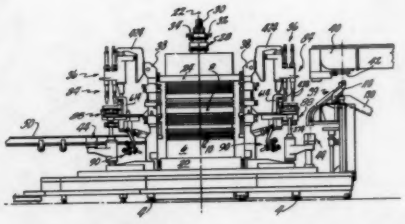
GLASSWARE MOLD FORMING APPARATUS

Francis A. Dahms, Tariffville, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Division of Ser. No. 179,381, Aug. 18, 1980, Pat. No. 4,339,264. This application May 7, 1982, Ser. No. 375,844

Int. Cl.³ C03B *9/40*

U.S. Cl. 65—264 **7 Claims**



1. In a glassware forming apparatus, at least one split blow mold mounted on said machine for movement between its open and closed position, at least one bottom plate mounted on said machine for movement into and out of engagement with said blow mold, blow mold moving means for moving said blow mold between its open and closed position, and bottom plate moving means for moving said bottom plate into and out of engagement with said blow mold, said blow mold moving means being independently operable from said bottom plate moving means.

4,416,682

1,3-BIS(AZOLYL)PROPANOLS AS FUNGICIDES AND PLANT GROWTH REGULATORS

Paul A. Worthington, Maidenhead, England, assignor to Imperial Chemical Industries PLC, London, England

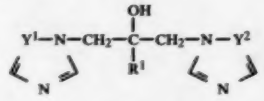
Filed Jun. 2, 1981, Ser. No. 269,581

Claims priority, application United Kingdom, Jun. 2, 1980, 8017959; Mar. 30, 1981, 8109923

Int. Cl.³ A01N *43/50, 43/64*; C07D *233/61, 249/08*

U.S. Cl. 71—76 7 Claims

1. A compound selected from the group consisting of compounds having the formula:



wherein R^1 is selected from the group consisting of: phenyl or benzyl substituted with one or more of the following: halogen, alkyl or haloalkyl each containing from 1 to 5 carbon atoms, alkoxy or haloalkoxy each containing from 1 to 4 carbon atoms, nitro, cyano, hydroxy, alkylthio containing from 1 to 4 carbon atoms, vinyl, phenyl or phenoxy; and wherein the alkyl moiety of the benzyl is unsubstituted, or substituted with alkyl containing from 1 to 4 carbon atoms, phenyl or chlorophenyl, Y^1 and Y^2 are =CH—or =N—; and salts, metal complexes, methyl, ethyl, propyl, butyl, phenyl, benzyl, p-chlorobenzyl, allyl and propargyl ethers and acetate, pivaloate, benzoate, tosylate and mesylate esters thereof.

6. A process for combating fungi, or regulating plant growth, which comprises applying to a plant, to seed of a plant or to the locus of a plant or seed, an effective amount of a compound as defined in claim 1.

7. A method of treatment of candidiasis or human dermatophyte infections which comprises administering to a human or animal an effective amount of a compound as claimed in claim 1.

4,416,683

BENZAMIDES, COMPOSITIONS AND AGRICULTURAL METHOD

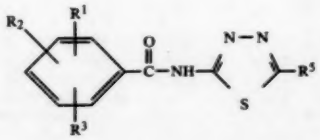
Kenneth W. Burow, Jr., Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 187,675, Sep. 16, 1980, abandoned. This application Sep. 14, 1981, Ser. No. 302,323

Int. Cl.³ A01N *43/02*

U.S. Cl. 71—90 51 Claims

1. A herbicidal composition comprising from about 1 to about 95 percent by weight of a benzamide herbicide of theformula



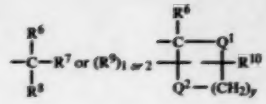
wherein:

R^1 is hydrogen or C_1–C_4 alkoxy;

R^2 is C_1–C_4 alkylthio or C_1–C_4 alkoxy;

R^3 is C_{d1}–C_4 alkyl, C_1–C_4 alkylthio, or C_1–C_4 alkoxy;

R^5 is



wherein:

R^6 is C_1–C_4 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_6 alkoxy, or C_1–C_6 alkylthio;

y is an integer from 0 to 5;

R^7 and R^8 independently are C_1–C_{13} alkyl or halo-C_1–C_{13} alkyl

wherein:

R^9 and R^{10} independently are hydrogen, halogen, C_1–C_4 alkyl, or C_2–C_4 alkenyl;

Q^1 and Q^2 independently are CH_2 ; and the agronomically acceptable salts thereof admixed with an agronomically-acceptable carrier, diluent, or adjuvant therefor.

4,416,684

SYNERGISTIC HERBICIDAL COMPOSITIONS

Gerald H. Thiele, Sunnyvale, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

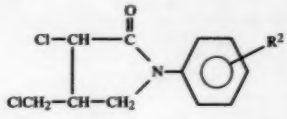
Continuation-in-part of Ser. No. 26,473, Apr. 2, 1979, abandoned. This application Dec. 31, 1979, Ser. No. 108,445

Int. Cl.³ A01N *43/36, 37/00*

U.S. Cl. 71—95 6 Claims

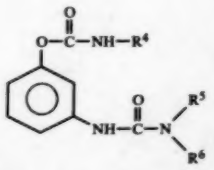
1. A synergistic herbicidal composition consisting essentially of a mixture of

(a) an effective amount of a pyrrolidone of the formula



in which R^2 is trifluoromethyl or cyano, and

(b) an effective amount of a m-ureidophenyl carbamate of the formula



in which

R^4 is C_1–C_4 alkyl,

R^5 is C_1–C_2 alkyl, and

R^6 is C_1–C_2 alkyl,

at a weight ratio of (a) to (b) of from about 0.5:1 to about 20:1.

4,416,685

TRIFLUOROETHYL-P-CHLOROPHENYLCARBAMATE HERBICIDE ANTIDOTE

Laddie L. Green, San Jose, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

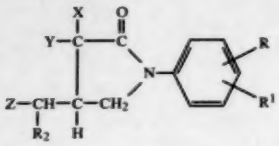
Filed Dec. 30, 1981, Ser. No. 335,789

Int. Cl.³ A01N *25/32*

U.S. Cl. 71—95 4 Claims

1. A composition comprising:

(a) an herbicidally effective amount of a pyrrolidone compound of the formula



in which

X is hydrogen, chlorine or methyl;

Y is hydrogen, chlorine, or bromine;

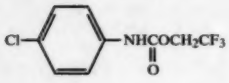
Z is chlorine or bromine;

R is hydrogen, alkyl, acetyl, chlorine, bromine, fluorine, iodine, trifluoromethyl, nitro, cyano, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, trifluoromethylthio, trifluoromethylsulfinyl, trifluoromethylsulfonyl, pentafluoropropionamido, or 3-methylureido;

R_1 is hydrogen, alkyl, chlorine, or trifluoromethyl; and,

R_2 is alkyl or hydrogen; and,

(b) a non-phytotoxic antidotally effective amount of a compound of the formula



4,416,686

3,4-DICHLOROPHENYLACETONITRILE-N-TERT-.BUTYLCARBAMOYLOXY ETHER FOR THE PROTECTION OF CROPS AGAINST INJURY BY HERBICIDES

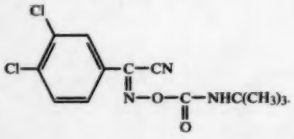
Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 938,205, Aug. 30, 1978, abandoned. This application Jan. 14, 1980, Ser. No. 112,049

Int. Cl.³ A01N *25/32*

U.S. Cl. 71—105 **2 Claims**

1. A method for protecting cultivated plants from being damaged by herbicidal chemicals selected from the group consisting of triazines, haloacetanilides and pyridyloxyphenoxypropionates, which method comprises applying to said plants, to parts thereof, or to the locus of their growth, an antidotally effective amount of the compound of the formula



4,416,687

3,5-BIS (TRIFLUOROMETHYL)PHENOXY CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

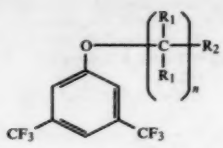
John J. D'Amico, and Tann R. Schafer, both of Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 1, 1982, Ser. No. 344,652

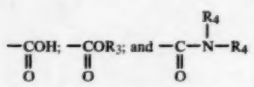
Int. Cl.³ E05B *59/00*

U.S. Cl. 71—109 **13 Claims**

1. A method of reducing injury to crop plants due to the application thereto of at least one weed herbicide which comprises applying to the plant locus a safening effective amount of at least one compound having the structural formula:



wherein R_1 is independently selected from the group consisting of hydrogen and C_1–C_5 alkyl, n is a whole number of 1–5, inclusive, and R_2 is selected from the group consisting of



wherein R_3 is selected from the group consisting of C_1–C_5 alkyl and agriculturally acceptable cations and R_4 is independently selected from the group consisting of hydrogen and C_1–C_5 alkyl.

4,416,688

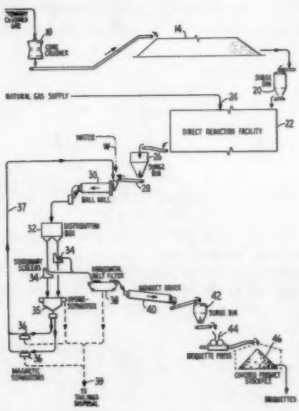
DIRECT REDUCTION OF ORES AND CONCENTRATION OF METALLIC VALUES

Richard B. Greenwalt, Danville, Calif., assignor to Raymond Kaiser Engineers, Inc., Oakland, Calif.

Continuation of Ser. No. 183,571, Sep. 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 55,290, Jul. 6, 1979, abandoned. This application Jan. 28, 1982, Ser. No. 343,554

Int. Cl.³ C22B *1/11*

U.S. Cl. 75—6 **6 Claims**



1. The process for recovering high quality malleable sponge iron with reduced phosphorous content from iron ores having a high phosphorous content comprising the following steps:

(a) subjecting a charge of crushed high phosphorous iron ore to direct reduction in a non-oxidizing atmosphere;

(b) heating said ore in a non-oxidizing atmosphere to temperatures within the range of at least about 900° C. to about 1200° C. to obtain iron with a ferrite grain struture and to obtain a high degree of metallization to recover a sponge iron material of increased Fe content having a carbon content of less than 0.10% as chemically combined carbon;

(c) cooling said sponge iron in a controlled non-oxidization

atmosphere of an inert gas or containing a minimum of carbon monoxide through the temperature in which the Boudouard reaction occurs to prevent re-oxidation thereof, to prevent the formation of any excess chemically combined carbon therein, and to avoid the formation of cementite;

(d) grinding said sponge iron in a ball mill to thereby convert the Fe content of said sponge iron to a flake powder of agglomerated sponge iron grains while grinding the oxides, gangue and other waste materials therein to a finely divided state; and

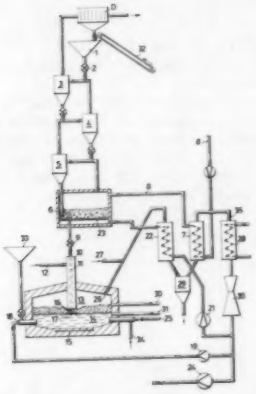
(e) screening and separating said sponge iron to obtain a concentrate having an Fe content of at least about 90%.

4,416,689

PROCESS FOR THE MANUFACTURE OF CRUDE IRON AND ENERGY-RICH GASES

Per H. Collin, Stocksund, Sweden, assignor to Asea AB, Västerås, Sweden

Filed Oct. 13, 1981, Ser. No. 311,007
Claims priority, application Sweden, Oct. 15, 1980, 8007225
Int. Cl.³ C21C *5/52*
U.S. Cl. 75—11 **4 Claims**



1. A process for preparing crude iron and energy-rich gases, the raw materials being comprised of iron ore concentrate and carbon-containing materials, and further oxygen gas and whereby electric energy is also supplied, comprising:

1.1: preheating an iron ore concentrate, or an iron ore concentrate in admixture with adjusted proportions of slag formers, by means of combustion gases from a combination of discharged gases from a prereduction according to 1.2 below;

1.2: prereducing iron oxides, in the concentrate preheated according to 1.1, by means of a part of discharged gases obtained from an arc furnace according to 1.3 below;

1.3: introducing a concentrate prereduced according to 1.2 into plasma zone below an electrode forming an arc in an arc furnace, and which furnace contains a crude iron melt, the temperature of said melt being maintained above 1300° C. by means of an adjusted supply of electric energy to said arc, and maintaining a dissolved carbon content in said crude iron melt at least about 2% of C and higher, by injection of carbon-containing materials into the crude iron melt below its surface;

1.4: precooling of gases discharged from the arc furnace by feeding directly into the gas stream an adjusted flow of a cooling agent consisting of water, steam, light hydrocarbons, or mixtures thereof;

1.5: recovering by heat exchange a part of the physical heat content of the gases precooled according to 1.4, said heat exchange being also with gases for the prereduction according to 1.2, air for the preheating according to 1.1, or water for the generation of steam or hot water;

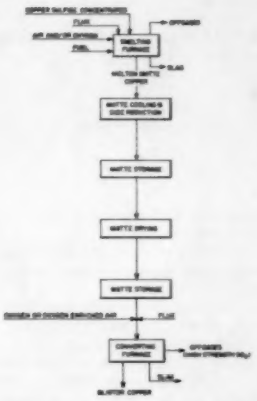
1.6: recycling, for prereduction, the energy-rich gases heat exchanged according to 1.5, or recycling for prereduction said energy-rich gases after freeing these from dust, said prereduction being according to 1.2.

4,416,690

SOLID MATTE-OXYGEN CONVERTING PROCESS

Kenneth J. Richards, and David B. George, both of Salt Lake County, Utah, assignors to Kennecott Corporation, Cleveland, Ohio

Filed Jun. 1, 1981, Ser. No. 268,765
Int. Cl.³ C22B *15/06*
U.S. Cl. 75—26 **17 Claims**



1. An autogenous process for the conversion of particles of solid copper matte to blister copper comprising:

(a) heating a conversion reaction vessel to a temperature at which the conversion reaction takes place,

(b) feeding sufficient quantities of particles of solid copper matte, oxygen and flux to the heated vessel such that the matte fed is converted and the principal source of heat for the continued operation of the conversion reaction is the oxidation of iron and sulfur in the matte fed, and

(c) withdrawing liquid blister copper, liquid slag and SO_2 gas from the vessel.

4,416,691

METHOD FOR CONVERTER BLOW CONTROL

Kiichi Narita, Kobe; Akitsu Tomita, Takatsuki; Nozomu Katagiri, Kobe; Kazuyuki Seki, Kobe; Tetuo Sato, Kobe; Minoru Kitamura, Nishinomiya; Shozo Kawasaki, Kobe, and Yasuo Kanazuka, Hyogo, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Continuation of Ser. No. 165,713, Jul. 3, 1980, abandoned, which is a continuation of Ser. No. 934,492, Aug. 16, 1978, abandoned. This application Mar. 25, 1982, Ser. No. 362,030
Int. Cl.³ C21C *5/32*
U.S. Cl. 75—60 **10 Claims**

1. A method for controlling the end point of the converter blow in an oxygen converter for the manufacture of low-carbon steel comprising carry out waste gas analyses in the final stage of the blow, to determine the rate at which carbon is being removed from the steel and thereby the decarburization rate of the blow; measuring the carbon content of the metal in said converter; solving a model differential decarburization rate equation, which takes into account the time delay between the occurrence of a decarburization reaction in the converter and its detection in the waste gas analyses, for the endpoint of

the converter blow, wherein said model differential decarburization rate equation (1) is

$$-\tau = F(c,b) - F\left(f^{-1}\left(-\frac{dc}{dt}, b\right), b\right) \quad (1)$$

wherein

τ is the time delay (minutes),

$-dc/dt$ is the decarburization rate (% min.),

b is the decarburization rate index (1/%) as determined for each heat of molten metal,

c is the carbon content (%) of the molten metal,

F is a function obtained by the integration of a fundamental decarburization model formula,

$$-dc/dt = f(c,b)$$

f^{-1} is an expression derived from said fundamental decarburization model formula,

$$-dc/dt = f(c,b)$$

where c is a dependent variable, and t is time and

$$b' = g(b) \quad (2)$$

wherein

b′ is the decarburization rate index (1/%) near the endpoint of the blow, and

g(b) is a function for improving the predictability of the carbon content of the molten metal at the endpoint of the blow;

wherein in determining the decarburization rate index, b′, near the endpoint of the blow by substituting the decarburization rate index, b, into equation (2), control of the carbon content of the molten metal is achieved by substituting b′ for b in equation (1), substituting the decarburization rate obtained by the waste analyses into equation (1) and the time point at which the so calculated carbon content coincides with a preselected target carbon content is the end point of the blow; and

stopping said blow when the calculated endpoint is reached.

4,416,692

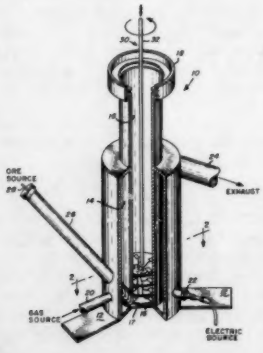
PROCESS FOR EXTRACTING GOLD, SILVER, PLATINUM, LEAD, OR MANGANESE METALS FROM ORE

Glen R. Burch, 825 Ticonderoga Dr., Sunnyvale, Calif. 94087

Filed Feb. 23, 1981, Ser. No. 236,997

Int. Cl.³ C22B *11/12*

U.S. Cl. 75—63 **16 Claims**



1. A process for extracting gold, silver, platinum, lead or manganese metals from ore comprising such metals, in steps comprising:

a. pulverizing an ore material comprising gold, silver, platinum, lead or manganese into fine particles;

b. drying the ore particles thoroughly to remove moisture;

c. melting, in a suitable right cylindrical melting chamber, a preselected amount of elemental lead and maintaining the molten lead within a predetermined temperature range;

d. introducing the dried, pulverized ore into the molten elemental lead at the lower portion of the right cylindrical melting chamber;

e. agitating the molten mixture, both translationally and rotationally throughout the introduction of said ore to the right cylindrical melting chamber and as said ore gradually rises from said lower portion of the right cylindrical melting chamber;

f. pouring the molten mixture into a cooling vessel to cool the mixture and separate the metallic mixture from the slag; and

g. removing the slag from the top of the mixture

whereby the metallic mixture may then be recovered or refined to separate the various metallic components of gold, silver, platinum, lead or manganese therein.

4,416,693

RECOVERY OF TITANIUM METAL VALUES

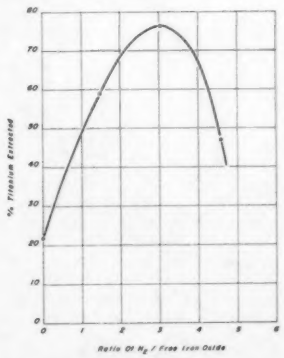
William K. Tolley, Salt Lake City, Utah, assignor to UOP, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 142,510, Apr. 21, 1980, abandoned. This application Dec. 17, 1981, Ser. No. 331,846

The portion of the term of this patent subsequent to Nov. 20, 1996, has been disclaimed.

Int. Cl.³ C21B *15/00*; C01G *23/04*

U.S. Cl. 75—101 R **8 Claims**



1. In a process for the recovery of titanium metal values from a titanium and iron-bearing source which comprises the steps of:

(a) crushing said source;

(b) subjecting the crushed source to an oxidation treatment with an oxidizing agent at an elevated temperature in the range of 700° to 800° C. and less than sufficient to form pseudobrookite;

(c) subjecting said crushed source to a reductive roast in the presence of a reductant at an elevated temperature;

(d) leaching the resultant reduced source with a leach solution comprising a hydrogen halide to form soluble metal halide;

(e) separating insoluble gangue from the soluble metal halide;

(f) precipitating titanium dioxide from the soluble metal halide by treatment with iron oxides;

(g) separating and recovering said titanium dioxide;
(h) regenerating and recovering the iron oxide used in step (f) and the hydrogen halide in step (d), the improvement which comprises using as said reductant in reductive roast step (c) a gas selected from the group consisting of hydrogen, carbon monoxide and mixtures of hydrogen and carbon monoxide in an amount of from about 1.5 to about 4.5 times the amount which is stoichiometrically required to reduce the iron oxide present in said source to metallic iron.

4,416,694

SAND RECLAMATION

John Stevenson, Sutton Coldfield; John Machin, Lichfield, and David L. Dyke, Birmingham, all of England, assignors to Foseco International Limited, England

Filed May 29, 1981, Ser. No. 268,301
Claims priority, application United Kingdom, Jun. 5, 1980, 8018423
Int. Cl.³ C04B *19/04*
U.S. Cl. 106—84 **5 Claims**

1. A method of producing an acceptable reclaimed sand from foundry moulds or cores which have been used to produce metal castings which method comprises comminuting to particulate form, used molds or cores formed from a composition consisting essentially of particulate sand, aqueous sodium silicate and an alkylene carbonate, with the content of alkylene carbonate not exceeding 11% by weight based on the weight of aqueous sodium silicate and subjecting the resultant particles to an attrition process so as to remove contaminants therefrom and wherein prior to or during the attrition process the particles are dried so that they contain no more than 0.8% by weight of residual moisture as determined by loss or ignition at 550° C.

4,416,695

HYDRAULIC CEMENTS

Matthew C. Ball, and Donald W. Tomkins, both of Loughborough, England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 179,984, Aug. 21, 1980, abandoned. This application Nov. 24, 1981, Ser. No. 324,656
Claims priority, application United Kingdom, Aug. 22, 1979, 7929165
Int. Cl.³ C04B *7/35*
U.S. Cl. 106—90 **29 Claims**

1. A modified hydraulic cement product comprising a hydraulic calcium silicate-based cement having a Blain surface area of at least 3,000 cm^2/g and/or an iron content of less than 2.5% by weight expressed in terms of the ferric oxide content of the dry cement, in which the cement has been treated with an additive comprising a monoaldehyde under the alkaline conditions prevailing in the cement before or during the setting reaction.

4,416,696

METHOD FOR HEAT TREATING CEMENT CLINKER RAW MATERIALS

Steven J. Zagar, Milwaukee, and James L. Shy, East Troy, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 16, 1982, Ser. No. 418,703
Int. Cl.³ C04B *7/44*
U.S. Cl. 106—100 **7 Claims**

1. A method for heat treating pulverulent raw material for the production of cement clinker in an installation comprising a first and second heat exchanger; a reactor operable to receive heat treated raw material from said heat exchanger; and a cooler operable to accept a hot cement clinker from said reactor and cool said reactor with a gas to form a cool clinker and a hot waste gas; said first heat exchange comprising a preheat stage, a calcining stage and a superheating stage with means within said calcining and superheating stages operable to receive a fuel and a gas containing free oxygen and combust said fuel with said gas; said raw material comprising a calcareous component and an argillaceous component; said argillaceous component having an eutectic temperature at which said argillaceous component enters an adhesive phase; said calcareous component having a calcining temperature at which an endothermic reaction occurs to calcine said component and said preheated argillaceous component and said calcined calcareous component having a mutual sintering temperature at which said components sinter to begin to form a cement clinker; the method comprising the steps of:

a. supplying a flow of said calcareous component to said preheat stage of first heat exchanger and supplying a flow of said argillaceous component to said second heat exchanger;
b. supplying a flow of a hot gas to said preheat stage and preheating said calcareous component with said gas;
c. passing said preheated flow of calcareous material to said calcining state;
d. admitting a flow of a fuel to said calcining stage and a flow of a gas containing free oxygen to said calcining stage;
e. combusting said fuel with said gas within said calcining stage to produce a hot product gas and further heating said preheated calcareous component with said product gas until said endothermic process is substantially complete;
f. passing said further heated calcareous component to said superheating stage and admitting a flow of fuel and a gas containing free oxygen to said superheating stage;
g. combusting said fuel with said gas within said superheating stage to produce a hot product gas and heating said calcined calcareous component with said hot product gas to a temperature not less than said sintering temperature;
h. discharging said calcareous component from said superheating stage and passing said product gas from said superheating stage to said second heat exchanger and heating said argillaceous component with said product gas to a temperature less than said eutectic temperature; and
i. discharging said heated argillaceous component from said second heat exchanger whereby said argillaceous component and said calcareous component may be blended and sintered to a cement clinker in said reactor with said reactor supplying only an additional amount of heat needed to augment the heat of said calcareous component to maintain a sintering reaction between said components.

4,416,697

METHOD FOR PREHEATING CEMENT CLINKER RAW MATERIALS

Steven J. Zagar, Milwaukee, and James L. Shy, East Troy, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 16, 1982, Ser. No. 418,714
Int. Cl.³ C04B *7/44*
U.S. Cl. 106—100 **9 Claims**

1. A method for heat treating pulverulent raw material for the production of cement clinker in an installation comprising a first and second heat exchanger; a reactor operable to receive heat treated raw material from said heat exchanger; and a cooler operable to accept a hot cement clinker from said reactor and cool said reactor with a gas to form a cool clinker and a hot waste gas; said first heat exchanger comprising a preheat stage, a calcining stage and a superheating stage with means within said calcining and superheating stages operable to receive a fuel and a gas containing free oxygen and combust said fuel with said gas; said raw material comprising a calcareous component and an argillaceous component; said argillaceous component having an eutectic temperature at which said argillaceous component enters an adhesive phase; said calcareous component having a calcining temperature at which an endothermic reaction occurs to calcine said component and said preheated argillaceous component and said calcined calcare-

ous component having a mutual sintering temperature at which said components sinter to begin to form a cement clinker; the method comprising the steps of:

a. supplying a flow of said calcareous component to said preheat stage of first heat exchanger and supplying a flow of said argillaceous component to said second heat exchanger;
b. supplying a first flow of a hot gas to said preheat stage and preheating said calcareous component with said gas;
c. passing said preheated flow of calcareous material to said calcining stage;
d. admitting a flow of a fuel to said calcining stage, a flow of a gas containing free oxygen and a second flow of a hot gas to said calcining stage;
e. combusting said fuel with said gas within said calcining stage to produce a hot product gas and further heating said preheated calcareous component with said product gas and said second flow of a hot gas until said endothermic process is substantially complete and reducing the temperature of said product gas and second flow of gas;
f. passing said further heated calcareous component to said superheating stage and admitting a flow of a fuel and a gas containing free oxygen to said superheating stage;
g. combusting said fuel with said gas within said superheating stage to produce a hot product gas and heating said calcined calcareous component with said hot product gas to a temperature not less than said sintering temperature;
h. discharging said calcareous component from said superheating stage and passing said product gas from said superheating stage;
i. supplying a third flow of a hot gas to said second heat exchanger and heating said argillaceous component with said third flow to a temperature less than said eutectic temperature; and
j. discharging said heated argillaceous component from said second heat exchanger whereby said argillaceous component and said calcareous component may be blended and sintered to a cement clinker in said reactor with said reactor supplying only an additional amount of heat needed to augment the heat of said calcareous component to maintain a sintering reaction between said components.

4,416,698

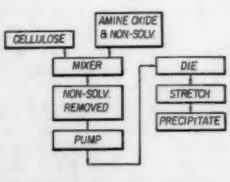
SHAPED CELLULOSE ARTICLE PREPARED FROM A SOLUTION CONTAINING CELLULOSE DISSOLVED IN A TERTIARY AMINE N-OXIDE SOLVENT AND A PROCESS FOR MAKING THE ARTICLE

Clarence C. McCorsley, III, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 16,789, Mar. 2, 1979, Pat. No. 4,246,221, which is a continuation-in-part of Ser. No. 847,200, Oct. 31, 1977, abandoned, and Ser. No. 819,082, Jul. 26, 1977, Pat. No. 4,144,080. This application Apr. 3, 1980, Ser. No. 136,990

Int. Cl.³ C09J *3/04*; D01F *6/00*

U.S. Cl. 106—163 R **17 Claims**



1. A shaped cellulose article which has been formed by a process which comprises shaping a solution containing cellulose dissolved in a solvent therefor which contains a tertiary amine N-oxide solvent for cellulose and a nonsolvent for cellulose which is miscible with the tertiary amine N-oxide solvent, stretching the resulting shaped solution and then precipitating the cellulose from said resulting shaped solution to form said shaped cellulose article having improved physical properties.

4,416,699

ALUMINA COATED TiO_2

Howard W. Jacobson, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 341,334, Jan. 21, 1982, abandoned. This application Feb. 22, 1983, Ser. No. 468,769

Int. Cl.³ C09C *1/36*

U.S. Cl. 106—300 **26 Claims**

1. TiO_2 rutile pigment particles exhibiting good resistance to chalk-fade reaction, high gloss and excellent dispersibility suitable for use in paint systems comprising a composite coating consisting essentially of dense alumina and boehmite alumina totaling 2–6% by weight alumina based on the TiO_2, said composite dense and boehmite alumina present in a weight ratio of 8:1–1:2 of dense to boehmite, the dense alumina defined as alumina having incorporated therein sulfate ion in a weight ratio of aluminum to sulfate of 10:1–1.3:1.

8. A process for preparing a chalk-fade resistant TiO_2 pigment having 2–6% by weight of alumina based on the TiO_2, said alumina having a 8:1–1:2 weight ratio of dense to boehmite alumina and a weight ratio of aluminum to sulfate of 10:1–1.3:1 comprising

(a) adding TiO_2 rutile pigment to water with agitation to form a slurry;
(b) heating the thus prepared slurry to 40°–90° C.;
(c) adding a soluble basic aluminum comcompound and/or an inorganic base to the slurry to raise the pH to 7.0–9.5;
(d) adding a sufficient amount of the soluble aluminum compound to deposit a total of 0.5–2% by weight alumina based on the TiO_2 while maintaining the pH at 7.0–9.5;
(e) lowering the pH to 5.2–6.5 with an acid;
(f) adding a sufficient amount of the soluble aluminum compound to deposit in the presence of the required amount of sulfate ions 2–6% by weight of total alumina based on the TiO_2 while maintaining the pH at 5.2–6.5 at a temperature of 40°–65° C.;
(g) optionally agitating the slurry at 40°–65° C. for 1–180 minutes; and
(h) separating and washing the thus treated TiO_2 free of soluble salts.

17. A process for preparing a durable TiO_2 pigment having 2–6% by weight of alumina based on the TiO_2, said alumina having a 8:1–1:2 weight ratio of dense to boehmite alumina and a weight ratio of aluminum to sulfate of 10:1–1.3:1 comprising

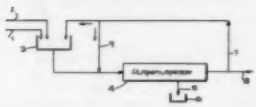
(a) adding TiO_2 rutile pigment to water with agitation to form a slurry;
(b) heating the thus prepared slurry to 30°–65° C.;
(c) adjusting the pH to 5.2–6.5;
(d) adding a sufficient amount of the soluble aluminum compound to deposit in the presence of the required amount of sulfate ions 2–6% by weight of total alumina based on the TiO_2 while maintaining the pH at 5.2–6.5 at a temperature of 30°–65° C.;
(e) agitating the slurry at 30°–65° C. for 5–180 minutes;
(f) adjusting the pH to 6.0–9.5;
(g) agitating the slurry for 5–60 minutes at 40°–70° C. while maintaining the pH of 6.0–9.5; and
(h) separating and washing the thus treated TiO_2 free of soluble salts.

4,416,700

PROCESS FOR TREATING CARAMEL COLORS

Allen V. Clark, Winter Park, Fla.; Direl V. Myers, Atlanta, Ga., and Vaughn I. Hatch, Huntertown, Ind., assignors to The Coca Cola Company, Atlanta, Ga.

Filed Jul. 20, 1981, Ser. No. 285,131
Int. Cl.³ A23L *1/27*; C13D *3/16*
U.S. Cl. 127—34 **1 Claim**



1. A process for treating Type CP-1 or CP-2 caramel color to prepare a caramel color concentrate therefrom, comprising:

(a) subjecting a mixture of said caramel color and water to ultrafiltration through a semi-permeable membrane to yeild a permeated fraction which passes through the membrane and a retained fraction which does not pass through the membrane, said retained fraction comprising high molecular weight color bodies and water, the water being present in an amount reduced from that present in the original mixture of caramel color and water;

(b) adding water to the retained fraction and subjecting the resultant mixture to ultrafiltration through a semi-permeable membrane to yield a permeated fraction which passes through the membrane and a retained fraction which does not pass through the membrane, said retained fraction comprising high molecular weight color bodies and water, the water being present in an amount reduced from that present in the resultant mixture; and

(c) subjecting the retained fraction of step (b) to ultrafiltration through a semi-permeable membrane to yield a permeated fraction which passes through the membrane and a retained concentrated product fraction, which does not pass through the membrane, said retained concentrated product fraction comprising high molecular weight color bodies and water, the water being present in an amount reduced from that present in the retained fraction of step (b), wherein the pH of said mixture of caramel color and water, said resultant mixture and said retained fraction of step (b) is maintained above 6.5 during said ultrafiltration.

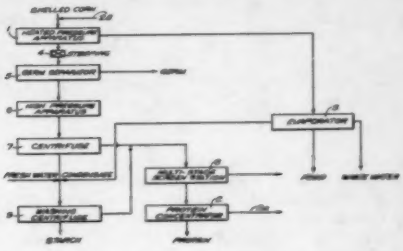
4,416,701

METHOD OF PRODUCING STARCH FROM GRAIN OR GROUND GRAIN PRODUCTS BY THE WET PROCESS

Heinrich Huster, Oelde; Friedrich Meuser, Berlin, and Carl-Heinz Hoepke, Bad Salzuflen, all of Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Mar. 5, 1982, Ser. No. 355,087
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110464
Int. Cl.³ C13L *1/00, 1/02*
U.S. Cl. 127—68 **6 Claims**

1. In a wet process for obtaining starch from raw grain matrial, wherein the raw material with process water added is steeped, fragmented, screened to remove fiber, and centrifuged to separate starch and suspended protein, the improvement wherein: the step of steeping comprises briefly steeping the raw material without degrading the morphological grain structures chemically and microbiologically by carrying out the steeping in water at a temperature of about 45° to 60° C. with the steeping time being exclusively for the absorption of water and sufficient to achieve a grain moisture content of greater than about 35% but no more than 12 hours under atmospheric pressure and no more than about 3 hours under a pressure of at least 5 bar and wherein the step of fragmenting comprises passing the steeped raw material through a splitter head at a



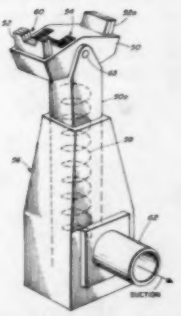
fragmenting pressure of at least 10 bar to fragment same under the action of shear forces and releasing the fragmenting pressure to the atmosphere; whereby the necessary structural disruption between the starch grains and the protein takes place.

4,416,702

TAPE CARTRIDGE CLEANER

James E. Jackman, Graham, Tex., assignor to Graham Magnetics, Incorporated, North Richland Hills, Tex.

Filed Apr. 9, 1982, Ser. No. 366,852
Int. Cl.³ B08B *5/02, 5/04*
U.S. Cl. 134—6 **7 Claims**



5. In a process for cleaning interior walls of a ring-like strap of the type used to hold and release magnetic tape for fluidic feeding in tape-reading apparatus, the strap comprising an annular conduit between interior and exterior walls of said strap, said conduit terminating in spaced apertures in said interior wall thereof, said process comprising the steps of

(a) supplying the air through said exterior wall under pressure into said annular conduit to maintain positive air-streams coming out of said apertures in said interior wall and, thereby, preventing dirt in interior walls from being forced into said apertures while

(b) carrying out a relative rotation between (1) a suction-cleaning means mounted in biased contact with said interior wall and (2) the interior wall of said strap,

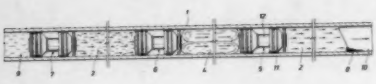
the improvement wherein said process comprises the step of utilizing a porous suction cleaning media for receiving within the mass of said cleaning media said dirt.

4,416,703

SYSTEM FOR REMOVING DEBRIS FROM PIPELINES

Paul R. Scott, Brazoria, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 20, 1981, Ser. No. 323,170
Int. Cl.³ B08B 9/04
U.S. Cl. 134—8 9 Claims



1. A method for removing particulate debris from a pipeline comprising, inserting a debris entraining gel plug into the pipeline with at least one pseudoplastic plug; moving the gel plug through the pipeline by a circulating motion essentially generating a closed toroid, the wall of the toroid adjacent the wall of the pipeline remaining relatively stationary and the center moving in the direction of motion of the gel plug; collecting at least part of the particulate debris with the gel plug; moving the pseudoplastic plug through the pipeline by viscoelastic flow; sealing the gel plug from fluid in the pipeline with the pseudoplastic plug; isolating the gel plug from the pseudoplastic plug with a mechanical separator; and collapsing the separator up to 40% of the diameter of the pipeline while moving the separator over debris in the pipeline and while substantially maintaining the seal between the gel plug and pseudoplastic plug.

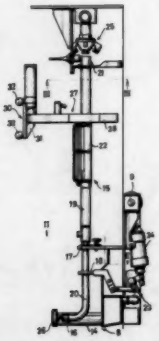
9. The method of claim 1, wherein the gel plug is between pseudoplastic plugs and the separators each comprise at least four polyurethane conical discs supported by a steel body and having dewatering discs at either end of the steel body.

4,416,704

METHOD AND INSTALLATION FOR CLEANING A SQUEEGEE DEVICE

Antonius T. H. van de Steeg, St. Anthonis, and Gerardus H. van Mondfrans, BN Sambeek, both of Netherlands, assignors to Stork Brabant B.V., Netherlands

Filed Feb. 5, 1982, Ser. No. 346,203
Claims priority, application Netherlands, Feb. 11, 1981, 8100663
Int. Cl.³ B08B 3/02
U.S. Cl. 134—34 9 Claims



1. A method of cleaning a squeegee device including a dye pipe and a squeegee blade comprising the steps of:

securing the squeegee device in a supporting element which is tiltably mounted in a housing;

flushing the pipe from one extremity and simultaneously externally rinsing both the pipe and the squeegee blade; and

flushing the pipe from the other extremity.

3. An installation for cleaning a squeegee device comprising:

a housing;

a frame mounted within the housing;

a supporting element for receiving a squeegee device, the supporting element being tiltably mounted on the frame and movable between an inoperative position in which the squeegee device is exposed externally of the housing and an operative position in which the squeegee device is disposed substantially vertically within the housing;

a plurality of spraying means stationarily mounted within the housing for spraying the interior and exterior of the squeegee device; and

a plurality of spraying means movable within the housing along the length of the squeegee device for dispensing cleaning fluid over the exterior of the length of the squeegee device.

4,416,705

COMPOSITION AND PROCESS FOR PRODUCTION OF PHOSPHATE COATINGS ON METAL SURFACES

Gunter Siemund, Heusensramm, and Han Y. Oei, Frankfurt, both of Fed. Rep. of Germany, assignors to Occidental Chemical Corporation, Warren, Mich.

Filed Feb. 26, 1982, Ser. No. 352,925
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108484
Int. Cl.³ C23F 7/10; C04B 9/02
U.S. Cl. 148—6.15 Z 7 Claims

1. An aqueous acidic zinc phosphate solution which comprises at least 6 g/l of Zn, at least 5 g/l P_2O_5, at least 1.0 g/l of an accelerator, calculated as ClO_3, and about 1 to about 50 g/l of SO_4, which solution has a total acid number of at least 20, a weight ratio of free P_2O_5:total P_2O_5 of 0.2–0.6:1 and a weight ratio of P_2O_5:Zn:ClO_3 of 1:0.5–4.0:0.01–1.0.

2. The composition as claimed in claim in which ClO_3 is present in an amount from about 1 to about 5 g/l.

3. The composition as claimed in claim 2 in which the ClO_3 is present in an amount from about 0.2 to about 2 g/l.

4. The composition as claimed in claim 1 in which the sulfate ions are present in an amount of from about 5 to about 20 g/l.

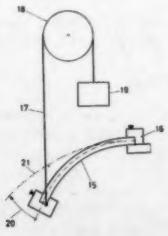
5. The composition as claimed in claim 2 in which NO_3 is present in an amount of at least 8 g/l and the weight ratio of P_2O_5:NO_3 is 1:0.2–6.0.

4,416,706

PROCESS TO PRODUCE AND STABILIZE A REVERSIBLE TWO-WAY SHAPE MEMORY EFFECT IN A CU-AL-NI OR A CU-AL ALLOY

Joachim Albrecht, Müliigen; Thomas Duerig, Nussbaumen; Olivier Mercier, Ennetbaden, and Walter Weber, Zurich, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jul. 29, 1982, Ser. No. 403,129
Claims priority, application Switzerland, Feb. 5, 1982, 707/82
Int. Cl.³ C21D 8/00
U.S. Cl. 148—11.5 C 3 Claims



1. A process of producing and stabilizing a reversible two-

way shape memory effect in a Cu-Al-Ni or a Cu-Al alloy, which comprises:

(1) solution treating a cast or powder metallurgically produced alloy in the temperature range of the β-solid solution;

(2) quenching the solution treated alloy in water;

(3) deforming said quenched alloy at a temperature below 300° C.; and

(4) subjecting said deformed alloy to a shape stabilization treatment comprising:

(i) heat treating said deformed alloy at a temperature in the range between 150°–425° C. for 0.5 to 180 minutes concomitantly with an externally applied load, thereby producing a tensile, compressive or torsional strain on the alloy of at least 1.0%;

(ii) cooling the heat treated alloy; and

(iii) releasing the cooled alloy from its externally applied load.

4,416,707

SECONDARY RECRYSTALLIZED ORIENTED LOW-ALLOY IRON

Karl Foster, Forest Hills Borough; Gary C. Rauch, Murrysville; Wayne M. Swift, Trafford, and Donald R. Thornburg, Forest Hills Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 14, 1981, Ser. No. 301,543

Int. Cl.³ H01F *1/04*

U.S. Cl. 148—111 **40 Claims**

1. In the method of producing (110) orientation in silicon-iron alloys having a silicon content less than about 2.5% and in which the alloy may be subject to an $\alpha \rightleftarrows \gamma$ phase transformation, the (110) orientation being characterized by a secondary recrystallization grain structure, the steps comprising, making a melt of the desired composition in which the sulfur content is within the range between 0.003% and 0.012%, the aluminum content is within the range between 0.005% and 0.015%, the nitrogen is between 0.003% and 0.015%, and the manganese is within the range between 0.03% and 0.30% casting the melt into ingots or slabs, hot working the ingots or slabs to a hot band, cold rolling to finish gauge in one or more operations with an intermediate annealing between cold-rolling operations, final annealing at a temperature between about 800° C. and 1050° C. and within the α phase and wherein said final annealing producing said secondary recrystallization grain structure.

4,416,708

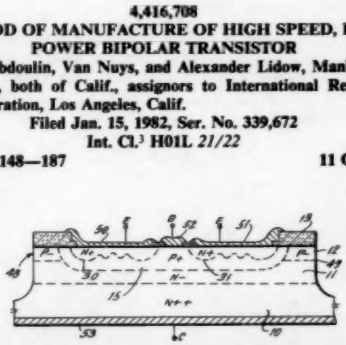
METHOD OF MANUFACTURE OF HIGH SPEED, HIGH POWER BIPOLAR TRANSISTOR

Edgar Abdoulin, Van Nuys, and Alexander Lidow, Manhattan Beach, both of Calif., assignors to International Rectifier Corporation, Los Angeles, Calif.

Filed Jan. 15, 1982, Ser. No. 339,672

Int. Cl.³ H01L *21/22*

U.S. Cl. 148—187 **11 Claims**



1. The process of manufacture of a high speed, high power transistor comprising the steps of:

forming a thin semiconductor body having flat, parallel first and second surfaces;

forming a relatively highly doped base region of one of the conductivity types in said first surface of said semiconductor body; said base region occupying a first area over said first surface and having a first depth beneath said first surface;

forming a diffusion mask over the exposed surface area of said base region; said mask including a plurality of spaced mask islands which are closely spaced to one another in laterally central areas of said base region and define a relatively large peripheral open-mask area which at least partly encloses said base region first area;

and diffusing a planar emitter region of the other of the conductivity types through said mask; the average doping concentration of said emitter region beneath said closely spaced islands being lower than the average doping concentration beneath said relatively large peripheral open-mask area.

4,416,709

AMORPHOUS MAGNETIC ALLOY MATERIAL

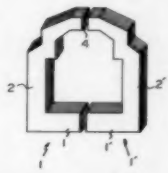
Kazuo Ohya, Chiba; Hiroki Fujishima, Sakura; Norio Ishijima, Higashimurayama; Hiroyoshi Itoga, Ichikawa, and Yasuhiko Kominami, Yachiyo, all of Japan, assignors to TDK Electronics Co., Ltd., Chiba, Japan

Filed Sep. 10, 1981, Ser. No. 300,921

Claims priority, application Japan, Sep. 15, 1980, 55-127568

Int. Cl.³ C22C *19/00*

U.S. Cl. 148—403 **13 Claims**



1. An amorphous magnetic alloy material having a high resistance against deterioration when stored for a long period of time at a high temperature and high humidity and having a high wear resistance, wherein said amorphous magnetic alloy material is expressed by the formula:

$$(Fe_pCo_qNi_r)_a\ Mb^{(1)}Cr_cM_d^{(2)}X_e$$

wherein $M^{(1)}$ is ruthenium alone or combined with at least one platinum family element selected from the group consisting of palladium, platinum, iridium, and rhodium, $M^{(2)}$ is at least one transition metal element other than iron, cobalt, nickel, ruthenium, palladium, platinum, iridium, rhodium, and chromium, and X is at least one vitrification element with the proviso that the parameters p, q, r, a, b, c, d, and e fulfill the following relationships: p+q+r=100%, p=about 4% to 7%; r=0% to about 10%, a+b+c+d+e=100 atomic %; b=about 0.01 to 8 atomic %; c=about 0.5 to 8 atomic %; d=0 to about 4 atomic %; and e=20 to about 26 atomic %.

4,416,710

POLYNORBORNENE-BASED COMBUSTIBLE COMPOSITIONS AND PROCESSES FOR THE FABRICATION THEREOF

William S. Anderson, Sunnyvale, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 14, 1980, Ser. No. 121,344

Int. Cl.³ C06B *45/10*; C10L *1/14*

U.S. Cl. 149—19.91 **21 Claims**

1. A novel composition of matter comprising polynorbornene having a liquid fuel material having a heat of combustion above about 9300 Kcal/cc dispersed uniformly therethrough, said composition having a heat of combustion of at least 9300 Kcal/cc.

4,416,711
PERCHLORATE SLURRY EXPLOSIVE

Harvey A. Jessop, Lehi, and Albert G. Funk, Salt Lake City, both of Utah, assignors to IRECO Chemicals, Salt Lake City, Utah

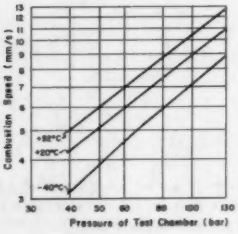
Filed Dec. 17, 1982, Ser. No. 450,647
Int. Cl.³ C06B *33/06*
U.S. Cl. 149—42 **13 Claims**

1. An explosive composition comprising, by weight based on the total composition:
(a) at least about 35% sodium perchlorate,
(b) from about 17% to about 35% water,
(c) from about 8% to about 25% polysaccharide polymer of plant origin; and
(d) minor amounts of gassing and cross-linking agents.

4,416,712
DOUBLE-BASE SOLID PROPELLANTS

Joachim Mönch, Neunkirchen, and Heinrich Brachert, Troisdorf-Oberlar, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Filed Mar. 23, 1982, Ser. No. 360,963
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113010
Int. Cl.³ C06B *25/26*
U.S. Cl. 149—98 **5 Claims**

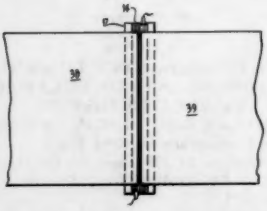


1. Double-base solid propellant composed of at least 85% by weight of a mixture of nitrocellulose and nitroglycerin, and containing, additionally, a mixture in a ratio of 1:0.5 to 1:10, of carbon black and cellulose acetate, in an amount of 0.2 to 6 wt.-%, based on the total weight of the solid propellant.

4,416,713
METHOD AND APPARATUS FOR JOINING ABUTTING EDGES OF SHEET MATERIAL

Ronald H. Brooks, 6 Baxter Ct., Chelsea, Victoria, Australia

Filed Jul. 24, 1980, Ser. No. 171,865
Int. Cl.³ B32B *31/26*
U.S. Cl. 156—64 **8 Claims**



1. A method of joining together abutting edges of woven, felted or other textile sheets, such as carpets, using a web which includes a strip of metal foil or electrically conductive wires and a heat softenable adhesive composition, said method comprising the steps of
(a) contacting the abutting edges of said sheets with said web so that the web overlaps said abutting edges,
(b) passing an electric current through the metal foil or electrically conductive wires to generate heat therein,
(c) sensing the voltage applied to said metal foil or the electrically conductive wires,
(d) sensing the current flowing,
(e) controlling the current flow to thereby control the heat generated in the metal foil or electrically conductive wires to maintain a temperature therein at which the said adhesive composition is softened to a tackiness whereby the adhesive releasably bonds the web to the sheets,
(f) adjusting the abutting edges as desired to form the required join,
(g) thereafter increasing the current flow to raise the web temperature and thereby melt the adhesive, and
(h) terminating the current flow when the adhesive has melted to cause the melted adhesive to set and bond the said sheets to the web.

6. In apparatus for use in joining together abutting edges of woven, felted or other textile sheets, such as carpets, using a web which has a backing strip of paper or paper like material, a strip of metal foil reinforcing filaments or threads at least some of which extend in a substantially transverse direction, and a heat softenable adhesive composition, said backing strip, metal foil and reinforcing material being secured together by a plurality of lines of stitching extending longitudinally of the web, the improvement comprising
(a) means for connecting an electrical power source to spaced points on said strip of metal foil to enable current to be passed therethrough;
(b) means to sense the voltage applied to the metal foil;
(c) means to sense the current flowing therethrough;
(d) control means responsive to said voltage sensing means and said current sensing means to regulate the current to a first predetermined value which will generate heat sufficient to soften the adhesive composition to a state of tackiness without fully melting the adhesive, whereby abutted edges of the sheets can be adjusted relative to each other to form the desired join; and
(e) means selectively operated to increase the current to a second predetermined value to fully melt the adhesive once the desired join is formed.

4,416,714
LABELING MACHINE FOR HEAT SHRINK LABELS

Wolfgang Hoffmann, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Continuation-in-part of Ser. No. 382,374, May 27, 1982, and a continuation-in-part of Ser. No. 438,386, Nov. 1, 1982. This application Mar. 3, 1983, Ser. No. 471,655
Int. Cl.³ B29C *27/00*; B32B *31/00*
U.S. Cl. 156—86 **17 Claims**

1. A method of applying heat shrinkable film to an article having a main, vertical body portion and at least one end portion which curves inwardly from the main body portion, said method comprising:
(a) tightly applying such film to the body portion of the article without heat shrinking by adhering the leading end

of the film to the body of the article, wrapping the film about the body, lapping the trailing end of the film over and adhering it to the leading end to form a side seam and also allowing a small overlap of the film over at least one such end portion,

(b) providing an extensible-retractable tongue or tongues, extensible to and retractable from a heat shielding position wherein it acts as a heat shield between an exterior source of heat and said side seam,

(c) cyclicly operating such extensible-retractable tongue(s) to extend it to the heat shielding position and thereafter retracting it, and

(d) applying heat from an external source to predominantly said small overlap to shrink it onto the article while said tongue is in extended position.

4,416,715

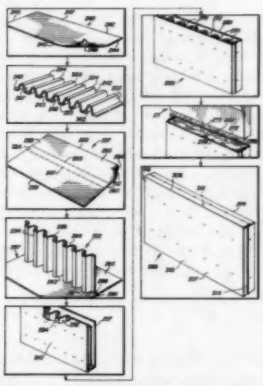
METHOD AND APPARATUS FOR FABRICATING INSULATIVE PANEL

Arthur G. Schramm, Scottsdale, and Jack C. Shaffer, Phoenix, both of Ariz., assignors to Doralyn Ann Hardy, Phoenix, Ariz.

Continuation-in-part of Ser. No. 957,665, Nov. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 937,266, Aug. 31, 1978, abandoned. This application May 27, 1980, Ser. No. 153,072

Int. Cl.³ B31F *1/20*; B29C *17/40*; B32B *3/00*

U.S. Cl. 156—210 **15 Claims**



1. A method of making an insulating structure comprising the steps of:

folding a single sheet of planar material to form a substantially rectangular parallelepiped enclosing a corrugated divider and defining an interior space, said envelope having a base, a front and a rear face, two side faces and a top face, that portion of the sheet adapted to be the top face of the envelope being unfolded in this step, said divider having alternating ridges and grooves, the apexes of said ridges and grooves being substantially parallel to each other, the apexes of the divider contacting the front and rear faces of the envelope to form prismatic compartments of substantially constant cross-section extending from the base of the envelope to the top face of the interior space;

securing the apexes of the divider to the front and rear faces of the envelope to form a substantially rigid structure;

filling the compartments through the top face of the interior space with a loose fill granular insulating material; and

forming the top face of the envelope to enclose said interior space.

4,416,716

METHOD OF PRODUCING INTERIOR MATERIAL OF CORRUGATED CARDBOARD

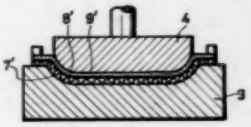
Takashi Ichikawa, and Sadao Moriyama, both of Yokohama, Japan, assignors to Ikeda Bussan Co., Ltd., Kanagawa, Japan

Filed Aug. 4, 1982, Ser. No. 405,238

Claims priority, application Japan, Aug. 27, 1981, 56-134673

Int. Cl.³ B31F *1/36*

U.S. Cl. 156—245 **6 Claims**



1. A method of producing interior material of corrugated cardboard comprising the steps of:

plasticizing in an oven corrugated cardboard base material by heating and moistening;

pressing the thus plasticized corrugated cardboard base material in a forming die separate from said oven and of low temperature in the range from 30° to 70° C. to shape it in a predetermined manner;

placing a covering sheet having a thermally melting sheet provided thereon so as to be faced toward the thus shaped corrugated cardboard base material;

and thereafter pressing said covering sheet in said low temperature forming die to melt said thermally melting sheet by the heat of said shaped corrugated cardboard base material to thereby bond said covering sheet to said shaped corrugated cardboard base material.

4,416,717

RAPID PROCESSING OF COMPOSITES

Francis S. Galasso, Manchester; Richard D. Veltri, East Hartford, and Raymond L. Taylor, Durham, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 2, 1982, Ser. No. 384,310

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—242 **5 Claims**

1. In the production of a fiber reinforced epoxy matrix composite part from composite tape the steps of:

cutting the tape to size;

stacking the cut tapes in the die;

first processing the composite within the die at a temperature of from 150° to 190° F. and at a pressure from 80 to 120 psi for between three and five hours;

then second processing the composite at a temperature of from 275° to 375° F. and a pressure of from 450 to 550 psi for about one hour; and

then third processing the composite at about 300° F. and at atmospheric pressure for about six hours.

4,416,718

PROCESS FOR SPLITTING SHEET

Timothy K. Fair, Sr., Blaine, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed Oct. 26, 1981, Ser. No. 314,712

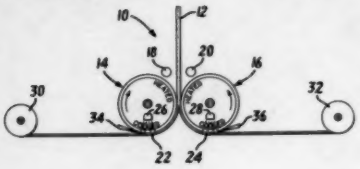
Int. Cl.³ B32B *31/18*

U.S. Cl. 156—344 **7 Claims**

1. A continuous method for splitting a unitary sheet of thermoplastic polymer net by contacting it with opposed, continuously moving heated surfaces comprising the steps of:

(a) heating a sheet of thermoplastic polymer net to a first temperature range wherein said thermoplastic polymer has poor cohesive properties and good adhesive properties with said surfaces;

(b) feeding the opposed faces of said sheet of thermoplastic polymer net between said opposed, continuously moving heated surfaces, said opposed surfaces being heated to a degree sufficient to maintain the temperature of said sheet within said first temperature range, and said heated surfaces moving at substantially the same rate as said sheet whereby said faces adhere to said opposed surfaces and said surfaces moving in a direction parallel to the opposed faces of the said net.



(c) moving said opposed surfaces away from each other to split said sheet of thermoplastic polymer net along a plane substantially parallel to the plane of the surface of the sheet to thereby form sheet parts, each said sheet part continuing to adhere to the surface with which it is in contact;

(d) reducing the temperature of each said sheet part to a temperature range wherein said sheet part is self-supporting and exhibits poor adhesive properties with said surface with which it is in contact;

(e) and removing the sheet parts from the said surface.

4,416,719

APPARATUS FOR COVERING BASE SHEET SURFACE

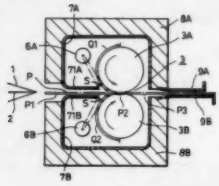
Tatsuo Horiuchi, Tatebayashi, Japan, assignor to Ushio Denki Kabushiki Kaisha and Kabushiki Kaisha Meiko Shokai, both of Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,294

Claims priority, application Japan, Feb. 27, 1981, 56-26854; Feb. 27, 1981, 56-26855

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—359 **2 Claims**



1. Laminating apparatus for covering opposite surfaces of a base sheet with plastic film while causing said base sheet to travel together with said plastic film superposed thereon along a base sheet travelling path, which consists of a base sheet feed path, a base sheet heating and press-bonding path and a base sheet discharge path, including a pair of rollers provided in abutment with the base sheet heating and press-bonding path interposed therebetween so as to constitute a pinch roller unit, said apparatus comprising a heat radiation lamp disposed in the vicinity of each of said rollers in such a way that said heat radiation lamp faces a circumferential area of each of said rollers, which area is running toward said base sheet heating and press-bonding path, and said heat radiation lamp also confronts said base sheet feed path, a heat radiation lamp control system adapted to control said heat radiation lamp in such a way that the intensity of the radiant heat from said heat radiation lamp is decreased when the temperature of the circumference of each of said rollers, facing said heat radiation lamp, has risen beyond a predetermined level, and heat transmission members disposed along and on opposite sides of said base sheet feed path and adapted to receive radiant heat from said heat radiation lamps, respectively, thereby irradiating said base sheet and said plastic film travelling on said base sheet feed path with a part of said radiant heat from said heat radiation lamp, said heat radiation lamps being the sole source of heat for laminating said film to said base sheet.

4,416,720

TIRE FORMING DRUM

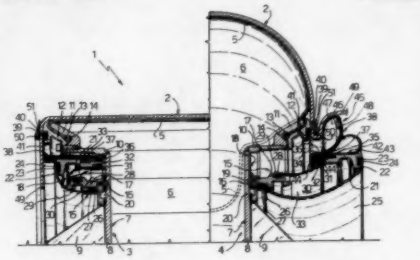
Viscardo Baldoni, Rome, Italy, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 20, 1982, Ser. No. 420,751

Claims priority, application Italy, Sep. 29, 1981, 68253 A/81

Int. Cl.³ B29H *17/22, 17/16*

U.S. Cl. 156—401 **8 Claims**



1. A tire forming drum of the type comprising two coaxial half drums which are angularly rigid with each other but are mobile axially relative to each other, each said half drum comprising an annular member arranged to support tubular plies of a carcass of a said tire and a respective bead thereof, characterized in that each said half drum further comprises a tubular member which is axially mobile, under the thrust of multiple air chamber means disposed between said annular member and tubular member, between a rest position in an annular seat provided in that end surface of the relative annular member which is opposite the surface of the latter which faces the other said half drum, and an extracted working position in which said air chamber means are arranged to partly wrap around the relative said bead from the inside by way of a relative end of said tubular plies.

4,416,721

APPARATUS FOR PRODUCING REINFORCED TUBING

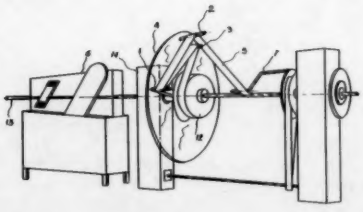
Alfio Deregibus, Padua, Italy, assignor to I.T.S. S.r.l., Milan, Italy

Filed Jul. 19, 1982, Ser. No. 399,842

Claims priority, application Italy, May 26, 1982, 21494 A/82

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—428 **5 Claims**



1. An apparatus for producing reinforced tubing by applying tapes to a metal core, comprising:

at least two units for moving a metal core rectilinearly;

at least two spiral-forming units for successively applying tapes to the moving metal core, as a spiral, forming a continuous layer, each of said spiral forming units comprising:

a roll of tape concentric to the core;

a disc adjacent to said roll and concentric to said core;

tensioning arms secured to said disc, providing tension and a desired inclination to said tape; and

means for driving said roll and means for driving said disc, said roll and said disc being driven with independent rotary motion and in opposite directions.

4,416,722

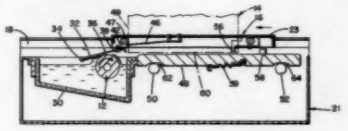
SHEET BINDING

Carl A. Bergman, South Dartmouth; Roy L. Thomas, and Richard A. Bourbeau, both of New Bedford, all of Mass., assignors to Standard Duplicating Machines Corp., New Bedford, Mass.

Filed May 17, 1982, Ser. No. 378,608

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—578 **11 Claims**



1. Apparatus for binding an edge of a stack of sheets comprising

a frame,

a drum rotatably mounted on an adhesive tank on said frame,

a doctor blade pivotally mounted to adjust the amount of adhesive on an upper surface of said drum,

a carriage slidably mounted to travel along a carriage axis transverse to the axis of said drum and above the upper surface of said drum,

said carriage including means to engage said stack of sheets so that during travel of said carriage past said drum, the lower edge of said stack is carried past the upper surface of said drum, and

wiping means to wipe adhesive off of the surface of said drum immediately prior to the arrival of the leading portion of said lower edge of said stack during travel of said carriage along said carriage axis, to keep excess adhesive from the front edge of said stack of pages,

said wiping means comprising means to move said doctor blade toward said drum immediately prior to the arrival of the leading portion of said lower edge of said stack of pages during the travel of said carriage,

said means to move said doctor blade comprising a lever attached to said doctor blade with a portion extending above the upper surface of said drum,

said carriage having a contact member positioned to push down said lever during travel of said carriage along said carriage axis.

4,416,723

METHOD FOR PRODUCING SAPPHIRE TUBES

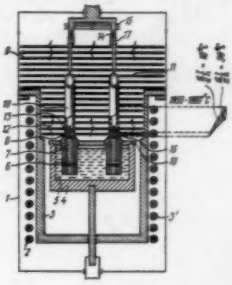
Boris B. Pelts, Lesnaya ulitsa, 63/43, kv. 157, Moscow; Beniamin A. Tumasian, prospekt Lenina, 39/12, kv. 51, Erevan; Leonid P. Egorov, Profsojuznaya ulitsa, 87, korpus 1, kv. 92, Moscow; Lev M. Zatulovsky, Orlikov pereulok, 8, kv. 55, Moscow; Peter M. Chaikin, Staroslobodsky pereulok, 14, kv. 18, Moscow; Efim A. Freiman, 2 Vladimirskaya ulitsa, 15, korpus 1, kv. 53, Moscow; Eduard A. Chalian, ulitsa Gvardeiskaya, 9, kv. 30, Erevan; Grant I. Abramian, ulitsa Olega Koshevogo, 26, kv. 3, Erevan; Stepan E. Azoian, 7 ulitsa Agesan, 17, Erevan, and Kliment A. Kostandian, 10 ulitsa Zeituna, 10, kv. 5, Erevan, all of U.S.S.R.

Division of Ser. No. 205,985, Nov. 12, 1980, Pat. No. 4,325,917, which is a continuation of Ser. No. 926,492, Jul. 20, 1978, abandoned. This application Jan. 7, 1982, Ser. No. 337,739

Claims priority, application U.S.S.R., Jul. 21, 1977, 2509201

Int. Cl.³ B01J *17/18*

U.S. Cl. 156—608 **9 Claims**



7. A method for producing a crystalline sapphire tube comprising melting aluminum oxide by means of induction heating in an air-tight chamber, pulling a tube from said melt using a seed through a die under an inert-gas blanket and an excess pressure between 0.1 to 0.3 atm. gauge, maintaining a longitudinal temperature gradient of 10° to 20° C./cm in the wall of said tube within a zone between a solidified front and a pulling region wherein the temperature is 1850° to 1900° C., said temperature gradient being maintained at least partially by regulating convective gas flow upstream of said die in said pulling region, annealing said tube at a temperature between 1950° and 2000° C. by heating said tube at a rate of 30° to 40° C./min for between 3 and 4 hours, and cooling said annealed tube to room temperature at a rate of 30° to 40° C./cm.

4,416,724

METHOD FOR PRODUCING INSULATOR SURFACES

Bernd Fischer, Ober-Ramstadt, Fed. Rep. of Germany, assignor to Gesellschaft für Schwerionenforschung mbH, Darmstadt, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 329,205

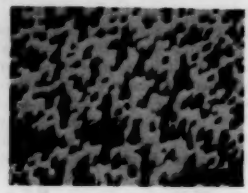
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046629

Int. Cl.³ B44C *1/22*; C03C *15/00*; A61K *27/02*; A61N *5/00*

U.S. Cl. 156—628 **4 Claims**

1. A method for producing insulator surfaces by increasing the surface area of a solid body constituting an electrical insulator and presenting such surface, comprising uniformly bombarding the surface of the body with a collimated beam of ions having a density of 10^6–10^9 ions/cm^2 generating latent nuclear tracks in the surface, and etching the bombarded surface to

widen the nuclear tracks into adjacent, individual etched channels in a manner to cause the number of channels multiplied by



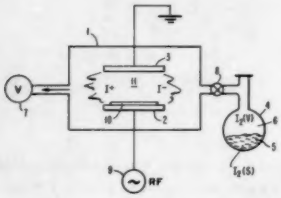
the surface area of an individual channel and divided by the total non-etched surface to be approximately equal to 1.

4,416,725

COPPER TEXTURING PROCESS

Jerome J. Cuomo, Lake Lincolndale; Pamela A. Leary, Wappingers Falls, and Dennis S. Yee, Putnam Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,922
Int. Cl.³ C23F *1/00*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—635 **9 Claims**



1. A room temperature dry process for providing an adherent textured surface to copper
characterized by
placing the sample within an evacuable chamber;
evacuating the chamber;
backfilling the chamber with iodine vapor to a pressure of ≈30 μTorr;
maintaining the sample at a temperature range room temperature to 50° C.;
applying an RF voltage of approximately 300 V at 50 watts power to grow a copper iodide layer; and
removing the copper iodide and removing the sample from the chamber.

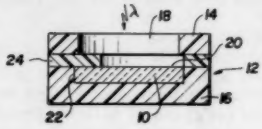
4,416,726

METHOD AND APPARATUS FOR CORRECTING THE ANGLES OF CUT OF QUARTZ PLATES

John R. Vig, Colts Neck, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 18, 1982, Ser. No. 359,534
Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 **19 Claims**

1. The improved method of correcting the angles of cut of a crystal resonator blank having a pair of opposing major faces comprising the steps of:
(a) mounting said crystal blank in a holder of etch resistant material;
(b) positioning said blank and holder in the path of a source capable of effectuating etching of an exposed face of said blank;
(c) masking a selected portion of at least one of said major faces with said etch resistant material to provide an exposed face portion; and



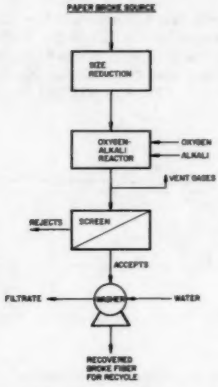
(d) subjecting the exposed face portion to said source to cause said exposed face portion to be etched away to a predetermined depth.

4,416,727

PROCESS FOR RECOVERING FIBER FROM WET-STRENGTH RESIN COATED PAPER

Edward F. Elton, Whitehall, and Vincent L. Magnotta, Coopersburg, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 11, 1982, Ser. No. 338,773
Int. Cl.³ D21C *5/02*
U.S. Cl. 162—6 **11 Claims**



1. A process for recovering and maintaining the brightness of fibers from a wet-strength resin coated paper waste or broke comprising the steps of:
(a) shredding the paper waste or broke to a comminuted form;
(b) subjecting the comminuted paper waste or broke to an alkaline solution to provide a pulp slurry and contacting the pulp with an oxyen atmosphere at elevated temperatures to free individual fibers from the resin and to maintain the brightness of said fibers and residual resin;
(c) diluting the separated fibers to a screenable consistency and screening the same to remove rejects; and
(d) recovering a screened fiber pulp for use in paper production.

9. A process for recovering and maintaining the brightness of fibers from a wet-strength resin coated paper waste or paper broke comprising the steps of:
(a) shredding the paper waste or broke to a 2 to 4 square inch comminuted form;
(b) subjecting the comminuted paper waste or broke to an alkaline solution charge of 4% to 15% to provide a pulp slurry of 10% to 25% consistency and contacting the pulp slurry with oxygen at a partial pressure of 30 to 60 psi at a temperature of 110° to 140° C. with mild agitation to free

the paper fibers from the resin and to maintain the brightness of said fibers and residual resin to at least 80% brightness;

(c) diluting the separated fibers to a 2% to 8% consistency and screening the same to remove rejects; and

(d) recovering a screened pulp fiber free of resin for reuse in paper production.

4,416,728

SELF-EXTINGUISHING PAPER MATERIALS

Giancarlo Albanesi, and Gianfranco Rinaldi, both of Milan, Italy, assignors to Saffa S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 350,423, Feb. 19, 1982, abandoned. This application Jul. 16, 1982, Ser. No. 398,798

Claims priority, application Italy, Mar. 5, 1981, 20134 A/81

Int. Cl.³ D21H *3/56*

U.S. Cl. 162—159 **10 Claims**

1. A self-extinguishing paper material consisting essentially of cellulose fibers and an effective amount of a flame retarder in the form of red phosphorus powder encapsulated with a cationized melaminic resin prepared from formaldehyde, triethanolamine, melamine and a monohydroxyl aliphatic alcohol having less than five carbon atoms, in weight percent ratios of 36.04 to 30.85%, 29.87 to 25.57%, 25.27 to 21.62% and 8.82 to 21.96% respectively.

8. A method of generating self-extinguishing properties in a cellulosic material which comprises incorporating into said cellulosic material an effective amount of melamine-encapsulated red phosphorus powder, said red phosphorus powder being encapsulated by a melamine condensate prepared from formaldehyde, methanol, triethanolamine and melamine in weight-percent ratios of 36.04–30.85%, 8.82–21.96%, 29.87–25–57% and 25.27–21.62%, respectively.

4,416,729

AMMONIUM POLYAMIDOAMINES

George R. Killat, and Larry R. Wilson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 4, 1982, Ser. No. 336,538

Int. Cl.³ D21H *3/48*

U.S. Cl. 162—164.3 **6 Claims**

1. A method for improving the wet strength of paper which comprises contacting the paper pulp with an amount of water-soluble polyamidoamine bearing a pendant ammonium moiety having cross-linking functionality which is effective to increase the wet strength of the paper sheet formed from said pulp, (2) forming the pulp into an article of desired shape and (3) subjecting the article to conditions sufficient to cross-link the polyamidoamine.

4,416,730

WIRE END SECTION OF A PAPER MAKING MACHINE

Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Jul. 8, 1982, Ser. No. 396,424

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128156

Int. Cl.³ D21F *1/02, 1/36*

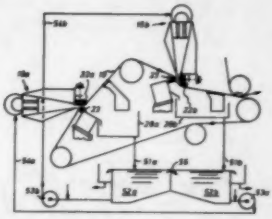
U.S. Cl. 162—264 **38 Claims**

1. A wire end section of a paper making machine, comprising:

a wire belt for receiving fibrous pulp suspension thereon and for permitting water drainage from the suspension through the wire belt; means for guiding and for driving the belt to move past a head box;

a head box for feeding pulp suspension to the wire belt; the head box including a first and a second flow guide wall, wherein the first guide wall is upstream in the movement of the wire belt past the head box and the second guide wall is downstream in the movement of the wire belt past the head box; both guide walls extending across the width dimension of the wire belt and extending above one surface of the wire belt; the guide walls defining a channel between them, and the channel having an outlet opening aimed for feeding pulp to the wire belt, whereby pulp travels through the channel to be fed through the outlet opening;

a slide shoe supported at the second guide wall and being located beyond the outlet opening of the head box and toward the wire belt; the slide shoe including a generally convexly curved first guide surface, which is curved gradually from being oriented more tranverse to the path of the wire belt past the head box to being oriented more parallel to that path nearer to the belt and further downstream in the movement of the belt; the first guide surface defining with the belt to a web forming zone for forming a web of the pulp suspension on the belt;



the first guide surface having a plurality of sections, including a first section in the region of the outlet opening and a second section in the region of the web-forming zone downstream along the path of the wire belt from the first section, the second section being curved more sharply than the first section;

a wire belt supporting device located at the opposite surface of the wire belt from the head box, and including a convexly curved second guide surface for engaging the opposite surface of the wire belt; the second guide surface being located in the vicinity of the outlet opening, upstream of the first guide surface in the path of the wire belt, for introducing the wire belt into the web-forming zone.

4,416,731

APPARATUS FOR CONTROLLING THE POSITION AND LOCATION OF A STATIONARY DEVICE OF A PAPER MACHINE WHICH ACTS ON A PAPER WEB BEING MANUFACTURED THEREIN

Jori Pesonen, Helsinki, and Markku Koivumäki, Jyväskylä, both of Finland, assignors to Valmet OY, Finland

Filed May 10, 1982, Ser. No. 376,537

Claims priority, application Finland, Nov. 25, 1981, 813764

Int. Cl.³ D21F *1/48, 1/54*

U.S. Cl. 162—308 **9 Claims**

1. Apparatus for controlling the position and location of a stationary device which constitutes a component of a paper machine and which acts on a paper web being manufactured therein over a transverse dimension thereof relative to the direction of travel of the web, said control apparatus being operative to control one or both of the distance of the device from the web and the angular orientation of the device, the device including a frame portion which is carried at each respective transverse end thereof by frame structure of the paper machine through a respective control apparatus, said control apparatus comprising:

a slide assembly including,

a first slide member supporting a respective end of the frame portion of the stationary device and having a sliding surface;

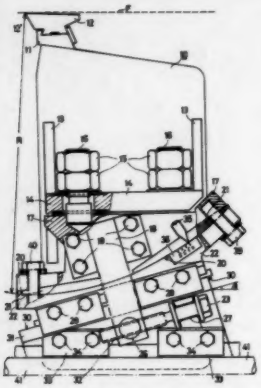
a second slide member supported by the paper machine frame structure and having a sliding surface; and

an intermediate slide member having two sliding surfaces,

said intermediate slide member being situated between said first and second slide members and forming a first pair of sliding surfaces with the first slide member and a second pair of sliding surfaces with the second slide member;

wherein one pair of sliding surfaces presented by said intermediate slide member and one of said first and second slide members have a curved segment configuration having a center of curvature which is substantially coincident with or immediately adjacent to a straight edge defining a tip of the stationary device;

wherein the other pair of sliding surfaces presented by said



intermediate slide member and the other of said first and second slide members have a linear configuration extending in the direction of movement thereof; and

wherein said control apparatus further includes adjusting means for moving said one of said first and second slide members and intermediate slide member with respect to each other on said curved sliding surfaces to control the angular orientation of the stationary device and for moving said other of said first and second slide members and intermediate slide member with respect to each other on said linear sliding surfaces to control the distance of the stationary device from the web independently of the angular orientation of the stationary device.

4,416,732

HORIZONTAL COKE OVEN BATTERY

Paul Gernhardt; Heinz Thubeauville, and Carl-Heinz Struck, all of Bochum, Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

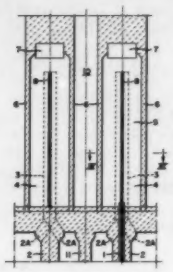
Filed Mar. 4, 1982, Ser. No. 354,818

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114340; Jun. 4, 1981, 3122112

Int. Cl.³ C10B *21/12, 21/16*

U.S. Cl. 202—139 **11 Claims**

1. In a horizontal coke oven battery in which heating chambers between coking chambers are divided by midfeathers into heating flues, the combination of feed flues extending upwardly through the heating chambers, said feed flues communicating with regenerators for the coke oven battery, and feed flue outlets connecting the feed flues to the heating flues, said feed flue outlets each comprising vertically-elongated slot means extending along substantially the the entire length of an associated feed flue to facilitate soft combustion and flame



formation, thereby greatly reducing temperature peaks and nitrogen oxide formation.

4,416,733

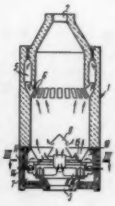
DRY QUENCHING APPARATUS FOR HOT COKE

Evgeny P. Likhogub; Stanislav S. Sergeev, and Alexandr N. Minasov, all of Kharkov, U.S.S.R., assignors to Giprokox, Kharkov, U.S.S.R.

Filed Jun. 16, 1982, Ser. No. 389,149

Int. Cl.³ C10B *39/00, 39/02*

U.S. Cl. 202—228 **1 Claim**



1. A dry quenching apparatus for hot coke comprising:

an upright housing having openings for charging and discharging the coke,

an annular header for supplying a cooling agent and arranged in the lower portion of said housing,

a centrally disposed distributor for the cooling agent arranged in the lower portion of said housing and communicating with said annular header for supplying the cooling agent,

a distribution header arranged above said annular header for supplying the cooling agent and communicating with the annular header through openings,

vertical partition walls arranged in said distribution header and defining sections therein, each section including at least one said opening whereby said headers communicate with each other,

flow governors for the cooling agent each arranged in at least one said opening in each section, and

an annular exhaust header for gases arranged in the middle portion of the housing.

4,416,734

SEPARATION OF NITROALKANOL BY AZEOTROPIC DISTILLATION

Martin J. Jacobs, Terre Haute, Ind., assignor to Angus Chemical Company, Northbrook, Ill.

Filed May 11, 1981, Ser. No. 262,078
Int. Cl.³ B01D 3/36; C07C 79/18
U.S. Cl. 203—18 23 Claims

1. A process for the separation of nitroalkanol from an aqueous solution thereof, comprising the steps of (a) adding thereto an organic liquid mixture consisting essentially of an aliphatic alcohol of 2–4 carbon atoms and a hydrocarbon of 6–9 carbon atoms, said organic liquid mixture added to the aqueous solution in an amout in excess of that required to form a ternary azeotrope with water, (b) separating the water as a vapor by azeotropic distillation at least until crystals appear in the unvaporized portion of the mixture, (c) cooling the unvaporized portion of the mixture thereby causing substantially complete separation of the nitroalkanol, and (d) recovering the nitroalkanol from the unvaporized mixture.

4,416,735

DILUENT AND METHOD FOR POTENTIOMETRIC ASSAY OF LIQUIDS

Thomas R. Kissel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 17, 1982, Ser. No. 389,515
Int. Cl.³ G01N 27/46, 1/00
U.S. Cl. 204—1 T 14 Claims

1. In admixture, a urine sample selected for potentiometric assay, and a diluent for said sample, said diluent comprising an aqueous solution having a pH of at least about 10.0 and a predetermined concentration of

(a) a protonated water-soluble organic amine having (i) a pKa greater than or equal to about 9.3, and (ii) a hydroxyalkyl of 1 to 5 carbon atoms, bonded to the nitrogen of the amine, wherein the oxygen-to-carbon bond of the hydroxy is no more than two bonds removed from the nitrogen and

(b) an acid anion,

said predetermined concentration being effective to produce a total ionic strength of said admixture within the range of about 150 millimolar and about 250 millimolar.

7. A diluent for compressing the ionic strength range of an aqueous sample, comprising an aqueous solution having

(i) a pH of at least about 10.0;

(ii) a predetermined concentration of

(a) a protonated water-soluble organic amine having (i) a pKa greater than or equal to about 9.3, and (ii) a hydroxyalkyl of 1 to 5 carbon atoms, bonded to the nitrogen of the amine, wherein the oxygen-to-carbon bond of the hydroxy is no more than two bonds removed from the nitrogen and

(b) an acid anion;

said predetermined concentration being effective to produce, when 4 parts of said solution are added to 1 part of two different saline solutions, one having a total ionic strength of 130 millimolar and the other a total ionic strength of 410 millimolar, a range of said ionic strength for the diluted saline solutions that is between about 150 millimolar and about 250 millimolar; and

(iii) a polymer present in amounts sufficient to provide to said solution a viscosity between about 1.3 centipoise and about 1.9 centipoise when measured at 25° C.

13. A method for potentiometrically determining the concentration of an ionic analyte in an aqueous solution, comprising the steps of

(i) admixing with said solution, a predetermined concentration of

(a) a protonated water-soluble organic amine having (i) a pKa greater than or equal to about 9.3, and (ii) a hydroxyalkyl of 1 to 5 carbon atoms, bonded to the nitrogen of the amine, wherein the oxygen-to-carbon bond of the hydroxy is no more than two bonds removed from the nitrogen and

(b) an acid anion, in an amount effective to provide a pH of at least about 10.0,

(ii) contacting a quantity of the admixture with a first electrode selective for said ionic analyte,

(iii) before, during, or after step (ii), contacting a quantity of a reference liquid having a known concentration of said analyte, with a second electrode, and

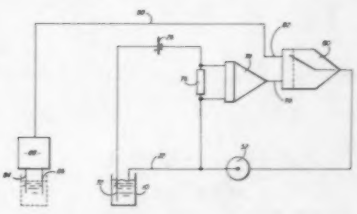
(iv) allowing said quantities to make ion contact with each other to permit a detection of electrical imbalance between them.

4,416,736

PROCEDURE FOR THE ENRICHMENT OF THE ELEMENT OF INTEREST FROM A SOLUTION FOR NONFLAME ATOMIC ABSORPTION SPECTROSCOPY

Bernhard Huber, Überlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Überlingen, Fed. Rep. of Germany

Filed Jan. 6, 1981, Ser. No. 223,070
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1980, 3000446
The portion of the term of this patent subsequent to Oct. 20, 1998, has been disclaimed.
Int. Cl.³ G01N 27/46
U.S. Cl. 204—1 T 8 Claims



1. Method for enriching a sought element from a solution for flameless atomic absorption spectroscopy, said method comprising the following steps:

inserting an electrode into a sample vessel containing said solution, said vessel being outside an atomic absorption spectrometer;

maintaining a constant voltage between said electrode and a counterelectrode;

integrating, with respect to time, the current passing through said solution via said electrodes;

terminating the electrolysis when a predetermined value of the current time integral has been reached;

removing said electrode from said sample vessel and inserting said electrode into a graphite tube through which the measuring light beam of said atomic absorption spectrometer passes; and

heating said graphite tube, whereby said electrode is indirectly heated and said sample components deposited thereon are atomized.

4,416,737

PROCESS OF ELECTROPLATING A NICKEL-ZINC ALLOY ON STEEL STRIP

Lowell W. Austin, Weirton, W. Va., and James O. Stoddart, Clinton, Pa., assignors to National Steel Corporation, Pittsburgh, Pa.

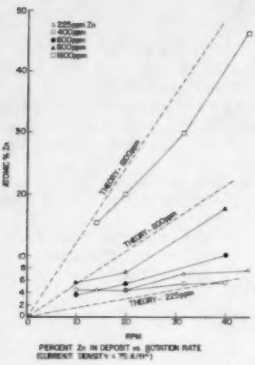
Filed Feb. 11, 1982, Ser. No. 347,704
Int. Cl.³ C25D 3/56, 7/00
U.S. Cl. 204—28 9 Claims

1. A process for electroplating a protective nickel-zinc alloy coating on metal strip or sheet which has a tendency to cor-

rode wherein said nickel-zinc alloy coating consists essentially of at least 80 percent nickel and up to 20 percent zinc, said process comprises:

providing an aqueous plating solution consisting essentially of dissolved nickel, in an amount ranging from about 25 to 45 g/l, and dissolved zinc, in an amount of at least 40 ppm, wherein the iron content of the plating bath is maintained at less than 100 ppm,

maintaining said plating bath at a pH of about 3 to about 5 and an elevated temperature of up to about 160° F.; and



immersing said metal strip or sheet in said plating bath and subjecting it to a cathodic plating current density of from about 50 to about 150 amperes/ft^2, to electroplate a protective nickel alloy coating.

3. The process of claim 1 wherein electroplating is conducted in a continuous plating line assembly; and wherein the zinc content of the nickel coating is dependent on the rate at which the metal strip or sheet is passed through the bath and on the distance through which the metal sheet or strip has traveled into the bath.

4,416,738

CHROMIUM PLATING

Richard Herrmann, Jr., Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 115,882, Jan. 28, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 351,013

Int. Cl.^{3} C25D *5/14, 5/40*

U.S. Cl. 204—32 R **12 Claims**

1. A method of restarting the electroplating of chromium onto an article having an electroplated chromium coating, said method comprising the steps of:

immersing said article in an aqueous alkaline solution of a cyanide salt;

applying an electrical potential to said article immersed in said solution and reversing the polarity of said potential at predetermined intervals for a first predetermined period of time while said article is immersed in said aqueous alkaline solution; and,

thereafter immersing said article in a chromic acid chromium electroplating bath and applying a cathodic plating potential to said article to electroplate chromium onto said article.

4,416,739

ELECTROPLATING OF TITANIUM AND TITANIUM BASE ALLOYS

Wallace Turner, Barnoldswick, England, assignor to Rolls-Royce Limited, London, England

Filed Mar. 3, 1981, Ser. No. 240,127

Claims priority, application United Kingdom, Apr. 16, 1980, 8012484

Int. Cl.^{3} C25D *5/42*

U.S. Cl. 204—32 R **7 Claims**

1. A method of electroplating a metal layer onto a titanium or titanium base alloy surface, said method comprising the successive steps of:

(a) exposing the surface to be electroplated to an aqueous solution comprising hydrofluoric acid and a member selected from the group consisting of formamide and substituted formamides, said solution containing from about 35 to about 45 grams per liter of fluoride ions and from about 1.5 to about 2.5 grams per liter of hydrogen ions and from about 600 to 800 grams per liter of said formamide or said substituted formamide, and continuing the exposure until the reaction between said surface and said solution has substantially abated and a grey deposit, which provides an adhesion-improving key between the titanium or titanium base alloy surface and the metal to be electroplated thereon, is formed on the titanium or titanium alloy surface; and thereafter

(b) electroplating a metal layer on the thus exposed surface covered by sid grey deposit.

4,416,740

METHOD AND BATH FOR THE ELECTRODEPOSITION OF PALLADIUM/NICKEL ALLOYS

Klaus Schulze-Berge, Remscheid, Fed. Rep. of Germany, assignor to Langbein-Pfanhauser Werke AG, Neuss, Fed. Rep. of Germany

Filed Mar. 5, 1982, Ser. No. 355,246

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108467

Int. Cl.^{3} C25D *3/56*

U.S. Cl. 204—43 N **2 Claims**

1. In a method of electrodepositing a palladium/nickel alloy coating upon a substrate wherein said coating is plated onto said substrate by electrodeposition from a bath containing 5 to 30 g per liter of palladium and 5 to 30 g per liter of nickel and having a palladium-nickel ratio such that the coating contains 30 to 90% by weight of palladium, the improvement which comprises providing in said bath during the electrodeposition of said coating at least one acetyleneamine or amino alcohol capable of improving the brightness and mechanical properties of said coating and selected from the group which consists of:

dimethylpropyn-2-ylamine,

1-diethylaminopropyn-(2),

1-diethylaminopentyn-2-ol-(4),

1-dimethylaminopropyn-(2), and

1,1-diethylpropyn-2-ylamine,

and mixtures thereof.

4,416,741

METHOD AND BATH FOR THE ELECTRODEPOSITION OF PALLADIUM/NICKEL ALLOYS

Klaus Schulze-Berge, Remscheid, Fed. Rep. of Germany, assignor to Langbein-Pfanhauser Werke AG, Neuss, Fed. Rep. of Germany

Filed Mar. 5, 1982, Ser. No. 355,245

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108466

Int. Cl.^{3} C25D *3/56*

U.S. Cl. 204—43 N **2 Claims**

1. In a method of electrodepositing a palladium/nickel alloy coating upon a substrate wherein said coating is plated onto said substrate by electrodeposition from a bath containing 5 to

30 g per liter of palladium and 5 to 30 g per liter of nickel and having a palladium-nickel ratio such that the coating contains 30 to 90% by weight of palladium, the improvement which comprises providing in said bath during the electrodeposition of said coating at least one acetylene alcohol or acetylene alcohol ether capable of improving the brightness and mechanical properties of said coating by promoting mixed crystal deposition, said acetylene alcohol or acetylene alcohol ether being selected from the group which consists of:

propargylalcohol
propargylalcoholmonoethoxylate (Hydroxyethylpropargylether)
butynediol
butynediol with 2 EO (Bis-(Hydroxyethoxy)-butyne)
butynediol with 1 PO (2-Hydroxypropylpropbutynylether)
hexynediol
2-methylbutyne-3-ol-2
3-methylpentyne-1-ol-3
3,4-dimethylpentyne-1-ol-3
3-ethylpentyne-1-ol-3
3-isopropyl-4-methylpentyne-1-ol-3
3-methylhexyne-1-ol-3 and
3-propylhexyne-1-ol-3.

4,416,742

PROCESS AND ELECTROLYTIC BATH FOR MAKING A RHODIUM-PLATED ARTICLE HAVING A BLACK OR BLUE COLOR

Takashi Kinase, Hitachi; Seiji Ichimura, Katsuta; Yoshio Kinjo, Narashino, and Yosuke Matsumoto, Chiba, all of Japan, assignors to Nippon Mining Co., Ltd. and Nippon Metal Plating Co., Ltd., both of Tokyo, Japan

Filed Sep. 23, 1981, Ser. No. 304,939

Claims priority, application Japan, Sep. 25, 1980, 55-134038; Sep. 25, 1980, 55-134039; Sep. 25, 1980, 55-134040

Int. Cl.³ C25D *3/50, 3/52*

U.S. Cl. 204—47 **12 Claims**

1. A process for electroplating rhodium onto a conductive substrate which process comprises:

(1) providing an aqueous acidic rhodium plating bath comprised of (a) a free acid, (b) a source of rhodium in a concentration ranging from about 0.10 to 20 g/l based on the rhodium metal, and (c) at least one additive selected from the group consisting of thiomalic acid and salts thereof, phthalic acid and salts thereof, butynediol and hypophosphite, said additive being present in an amount of at least about 0.01 g/l, with the pH of said bath not exceeding 6; and

(2) electroplating rhodium onto said substrate as a cathode in said bath under conditions such that the rhodium is plated in the form of a blue or black electroplate.

4,416,743

ELECTROLYSIS USING TWO ELECTROLYTICALLY CONDUCTING PHASES

Frank S. Holland, Hazel Grove Stockport, England, assignor to Manchem Limited, Manchester, England

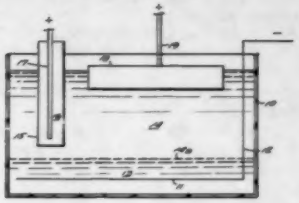
Filed Jan. 6, 1983, Ser. No. 456,315

Claims priority, application United Kingdom, Jan. 7, 1982, 8200355

Int. Cl.³ C25B *1/00;* **C25C** *1/02, 1/08, 1/16*

U.S. Cl. 204—59 R **19 Claims**

1. A method of electrolysis, which comprises passing an electric current between two electrodes and through an at least two-phase electrolyte system having as a first phase an aqueous electrolyte solution, and as a second phase an aqueous-immiscible electrolytically conductive liquid with at least one electrode located solely therein, said first and second phases being in direct liquid-liquid interfacial contact with each other.



4,416,744

PROCESS OF ELECTROLYTICALLY PRODUCING OXYACIDS OF CHLORINE

Karl Lohrberg; Rainer Pfohl, both of Heusenstamm, and Martin Gritschke, Karben, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

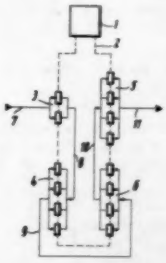
Continuation of Ser. No. 268,421, May 29, 1981, Pat. No. 4,370,207, which is a continuation of Ser. No. 110,155, Jan. 7, 1980, abandoned. This application Jun. 25, 1982, Ser. No. 392,036

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1979, 2901221

The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.

Int. Cl.³ C25B *1/24*

U.S. Cl. 204—95 **4 Claims**



1. A process of producing oxyacids of chlorine or salts of such acids by an electrolysis of salt solutions which are contaminated with calcium and/or magnesium or of sea water, which comprises:

(a) in an initial zone electrolyzing said salt solution with an electrolyte flow rate through an electrolytic cell at above 0.9 meter per second and up to 2.0 meters per second; and

(b) in a succeeding zone electrolyzing the salt solution obtained from said initial zone of step (a) at an electrolyte flow rate of 0.3 meter per second to less than 0.7 meter per second, the velocity of flow being stated for electrolyte which is free from gas.

4,416,745

PROCESS FOR RECOVERING NICKEL FROM SPENT ELECTROLESS NICKEL PLATING SOLUTIONS

Gilbert G. Warren, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 1, 1982, Ser. No. 353,772
Int. Cl.³ C25C 1/08
U.S. Cl. 204—112 7 Claims

1. A process for recovering nickel from spent electroless nickel plating solutions comprising:

(a) adding an inorganic base, selected from the group consisting of sodium hydroxide and potassium hydroxide, to said spent solution to raise the pH thereof to between 10–10.5;

(b) then adding ammonium hydroxide to said spent solution, to which said inorganic base has been added, and at said pH to raise the pH thereof to at least 11;

(c) heating said ammonium hydroxide containing spent solution to a temperature of between 40°–50° C.;

(d) subjecting said heated ammonium hydroxide containing spent solution to electrolysis, at a current density of about 10–30 amperes/ft^2, for a period of time sufficient to deposit a major portion of the nickel from said spent solution; and

(e) separating said spent solution from said deposit of nickel.

4,416,746

BIPOLAR REFINING OF LEAD

Robert C. Kerby, Rossland, and Clifford J. Krauss, Trail, both of Canada, assignors to Cominco Ltd., Canada

Filed Jan. 11, 1982, Ser. No. 338,654
Claims priority, application Canada, Feb. 12, 1981, 370752
Int. Cl.³ C25C 1/18
U.S. Cl. 204—114 4 Claims

1. In the process for the bipolar refinement of lead which includes: using impure lead bullion bipolar electrodes; an electrolyte containing lead fluosilicate, fluosilicic acid, and addition agents; a current density in the range of 100 to 600 A/m^2; an anode overvoltage maintained below the voltage at which impurities dissolve; an electrical current maintained at a value, related to the internal reistance of the cell, which will not cause the cell voltage to rise above the voltage at which impurities dissolve; periodical reversal of the polarity of the current applied to the cell; and recovering the refined lead from the bipolar electrodes, the improvements in combination which comprise:

(a) using an electrolyte containing at least about 85 g/l lead as lead fluosilicate and at most about 85 g/l lead fluosilicic acid so that the amount of dissolved lead as lead fluosilicate exceeds the amount of free fluosilicic acid in the electrolyte;

(b) applying a current to the cell at the beginning of the refining cycle to provide a current density in the cell of from about 240 A/m^2 to 450 A/m^2;

(c) applying the current to the cell for a refining cycle time of from about 72 hours to 130 hours;

(d) reversing the polarity of the current applied to the cell at a frequency of from about 4 to about 60 reversals per minute; and

(e) limiting the duration of each reversal to a period chosen from within the range of from 40 to 300 milliseconds, such that the total period of current reversal is in the range of from 1% to 4.5% of the refining cycle time,

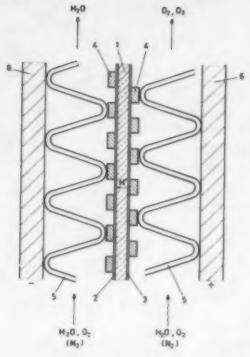
whereby even dense, strong and readily stripped refined lead deposits are obtained on the bipolar electrodes; whereby the deposited lead has a low impurity content; whereby both nodular and dendritic growths of lead are avoided; and whereby electrical shorting in the cell is substantially reduced.

4,416,747

PROCESS FOR THE SYNTHETIC PRODUCTION OF OZONE BY ELECTROLYSIS AND USE THEREOF

Anton Menth, Nussbaumen, and Samuel Stucki, Baden, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Apr. 29, 1982, Ser. No. 373,107
Claims priority, application Switzerland, May 11, 1981, 3023/81
Int. Cl.³ C25B 1/02
U.S. Cl. 204—129 6 Claims



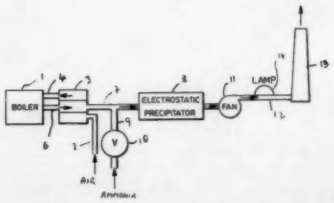
1. Process for the synthetic production of ozone by electrolysis, wherein water saturated with oxygen is used as starting material and, as the electrolyte, a solid electrolyte is used, which is coated with platinum on the cathode side and with PbO_2 on the anode side and is in the form of a thin cation exchange membrane, wherein the oxygen-saturated water is led along, both on the cathode side and on the anode side, parallel to the solid-electrolyte membrane, and wherein the current supply to the coatings of the solid electrolyte, which serve as electrodes, is effected, in each case, via an open metallic structure having a low flow-resistance for the water, and wherein the water is simultaneously utilized for removing the heat generated during the process.

4,416,748

PROCESS FOR REDUCTION OF THE CONTENT OF SO_2 AND/OR NO_x IN FLUE GAS

R. D. Samuel Stevens, Downsview, Canada, assignor to Concord Scientific Corporation, Downsview, Canada

Filed Sep. 8, 1981, Ser. No. 300,377
Int. Cl.³ B01J 19/12, 19/24
U.S. Cl. 204—157.1 P 22 Claims



1. Process for reduction of the content of NO and NO_2 in flue gas containing also substantial quantities of H_2O vapor comprising mixing the flue gas with NH_3 and irradiating the mixture with ultraviolet radiation of wavelength at least as great as about 190 nm and containing at least one component of

wavelength in the range from about 190 to about 220 nm, said radiation being substantially wholly free of any component with a wavelength below about 190 nm, and said process taking place in the absence of a solid state catalyst.

4,416,749

CROSSLINKED ETHYLENE/VINYL ACETATE COPOLYMER FILM AND PROCESS FOR TREATING SAME

Tibor G. Mahr, and Pallatheri M. Subramanian, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 259,422, May 1, 1981, Pat. No. 4,370,212. This application Aug. 30, 1982, Ser. No. 413,214

Int. Cl.³ B32B *27/30*; C08F *8/12*

U.S. Cl. 204—159.14 **10 Claims**

1. A process for treating ethylene/vinyl acetate copolymer (EVA) comprising:

(a) providing an EVA copolymer film containing about 35 to 50 percent copolymerized vinyl acetate by weight, said film being crosslinked as a result of being subjected to a 0.5 to 16 megarad dosage of high energy radiation; and

(b) alcoholyzing greater than 80 percent of the acetate groups in the film to depth of 0.5 microns in the film, while alcoholyzing less than 80 percent of the acetate groups at depths greater than 0.5 microns.

9. Crosslinked ethylene/vinyl acetate copolymer film containing about 35 to 50 percent copolymerized vinyl acetate by weight of the copolymer comprising:

greater than about 80 percent of the acetate in the film to a depth of 0.5 microns being hydrolyzed, and less than 80 percent of the acetate groups at depths greater than 0.5 microns being hydrolyzed.

4,416,750

ULTRAVIOLET CURABLE BASECOATS FOR VACUUM METALLIZATION

Edward J. Murphy, Mt. Prospect; Ronald J. Lewarchik, Arlington Hgts., and Jeffrey W. Thompson, Homewood, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 13, 1981, Ser. No. 311,057

Int. Cl.³ C08G *18/00, 63/00*

U.S. Cl. 204—159.19 **1 Claim**

1. An ultraviolet light-curable liquid coating composition for molded plastic objects comprising an alcoholic solvent solution of:

1—a polyurethane oligomer polyacrylate which is a derivative of an organic solvent-soluble hydroxy functional polyester having an average molecular weight of 500–1500 and an average of at least about 2.0 hydroxy groups per molecule, each hydroxy group carrying an acrylate ester group by a plurality of urethane linkages; and

2—an hydroxy-functional polyacrylate which is constituted by an organic polyol having a molecular weight below 500 and at least about 3 hydroxy groups per molecule, said polyol being esterified to contain at least about 1.5 acrylate ester groups per molecule and having at least about 0.5 unreacted hydroxy groups per molecule;

said polyacrylate ester being present in an amount of from 20–25% of total polyacrylate, and said solution having a solids content of from 60% to 80%, said solution further including a photoinitiator to render the composition curable on exposure to ultraviolet light.

4,416,751

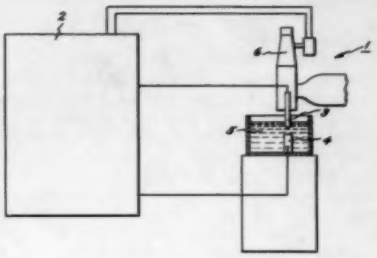
PROCESS FOR PRODUCING A FERROFLUID

Ami E. Berkowitz, and John L. Walter, both of Schenectady, N.Y., assignors to General Electric Co., Schenectady, N.Y.

Continuation of Ser. No. 133,587, Mar. 24, 1980, abandoned. This application Sep. 24, 1981, Ser. No. 305,310

Int. Cl.³ C07C *2/80*

U.S. Cl. 204—165 **5 Claims**



1. A process for producing a ferrofluid consisting essentially of composite particles composed of polymer-attached magnetic metallic particles in indefinite suspension in a carrier fluid which consists essentially of providing a pair of electrodes, immersing the electrodes in an organic dielectric liquid, applying a pulsed electric potential between the electrodes, adjusting the gap therebetween until there is an electric discharge eroding an electrode producing particulate magnetic material containing said composite particles composed of magnetic metallic particles adherently attached to organic polymer formed by the polymerization of said dielectric liquid, said polymer being in a fibrous or filamentary form, said electrodes being formed of a metallic composition which produces said magnetic metallic particles by said erosion, recovering said magnetic material from the dielectric liquid, and dispersing said recovered material in a carrier fluid in which said composite particles become indefinitely suspended, said composite particles being in the form of filamentary rafts or membranes of a size and density which maintains them in indefinite suspension in said carrier fluid.

4,416,752

METHOD OF COATING A CONDUCTING SUBSTRATE AND COATED SUBSTRATES OBTAINED THEREBY

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 11, 1982, Ser. No. 338,826

Int. Cl.³ C25D *13/08*

U.S. Cl. 204—181 R **13 Claims**

1. A method of coating a conducting substrate which comprises using the conducting substrate as the anode in an electrolyzed mixture comprising a cationically polymerizable organic material and 0.1 to 10% by weight, based on the weight of the cationically polymerizable organic material of aryliodonium salt or arylsulfonium salt having an MQ_d anion, where M is a metal or metalloid selected from boron, phosphorus, antimony and arsenic, Q is a halogen radical and d is an integer having a value of 4–6.

4,416,753

PROCESS FOR ELECTROCOATING AN ELECTRICALLY CONDUCTIVE SUBSTRATE

Wolfgang Batzill, Münster, and Horst Diefenbach, Nottuln, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,504

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3044447

Int. Cl.³ C25D *13/06, 15/00*

U.S. Cl. 204—181 C **10 Claims**

1. In a process for coating an electrically conductive substrate comprising connecting said substrate as the cathode in an electrocoating process, immersing said connected substrate in an electrocoating bath containing a cationic coating agent, carrying out an electrodeposition of said cationic coating agent on said substrate to produce said substrate coated with said cationic coating agent and hardening said substrate coated with said cationic coating agent, the improvement comprising said cationic coating agent comprising an aqueous dispersion comprising a mixture of:

A. water dispersed or water soluble cationic synthetic resins containing basic groups prepared by reacting resins containing epoxide groups and bases selected from the group consisting of organic amines and Mannich bases followed by protonation with acids to form a carrier resin; and

B. dispersed, finely divided, ionic plastics selected from the group consisting of epoxide resins, polyester resins, acrylate resin, polyurethane resins and polyamide resins having ionic groups selected from the group consisting of ammonium, sulfonium and phosphonium ions neutralized with acids.

4,416,754

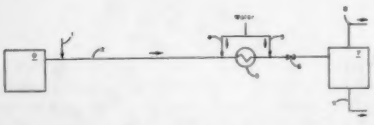
COMPOSITIONS AND PROCESS FOR DEDUSTING SOLIDS-CONTAINING HYDROCARBON OILS

Philip Merchant, Jr., Houston, Tex., and Dean L. Smith, Jr., Mountainside, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 24, 1981, Ser. No. 295,793

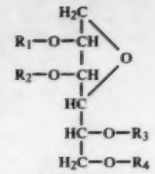
Int. Cl.³ B01D *17/06*

U.S. Cl. 204—190 **24 Claims**



11. In a process for dedusting oils characterized as unconventional whole heavy crudes, heavy petroleum crude fractions and residua, syncrudes and syncrude fractions which contain finely divided solids, water being admixed with said oil and the water and oil emulsified, and the emulsion then separated in an electrostatic coalescer to produce a clean oil phase which is drawn off on recovered, and a solids-containing aqueous phase, the improvement which comprises further admixing with said oil and water emulsion from about 10 parts to about 5000 parts, per million parts by volume of oil, of an admixture of compounds which comprises

(I) an ester surfactant characterized as follows:



where R_1, R_2, R_3, and R_4 are selected from

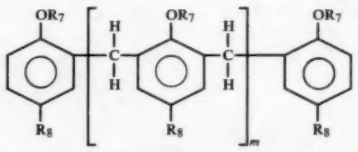
(a) ethoxy or propoxy groups, or mixed ethoxy and propoxy groups, and

(b) the dehydroxylated residue of a fatty acid molecule, or moiety represented by the formula

where R is a straight-chain hydrocarbon moiety which can be substituted or unsubstituted, saturated or unsaturated, and where unsaturated can contain conjugated or unconjugated double bonds, and

at least on and up to three of R_1, R_2, R_3, and R_4 is ethoxy, propoxy, or mixed ethoxy and propoxy groups, and

(II) an ethoxylated or propoxylated, or admixed ethoxylated/propoxylated, phenol formaldehyde resin oil soluble demulsifier substituted at a position para to the ethoxy or propoxy group, or mixed ethoxy/propoxy groups, by a hydrocarbyl group, said modified phenol formaldehyde resin being characterized as follows:



wherein

R_7 represents one or more ethoxy or propoxy groups, or mixed ethoxy and propoxy groups, and

R_8 is a hydrocarbyl radical selected from the group consisting of alkyl, aralkyl, cycloalkyl, aryl, alkaryl, alkenyl, and alkynyl, and

m is an integer of one or greater, the molecular weight of said resin ranging from about 2000 to about 20,000;

the ratio of demulsifier:surfactant ranging from about 1:1 to about 15:1, based on the sum total volume of the demulsifier and surfactant.

4,416,755

APPARATUS AND METHOD FOR PRODUCING SEMICONDUCTING FILMS

Gerald P. Ceasar, Rochester, and Scott F. Grimshaw, Fulton, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

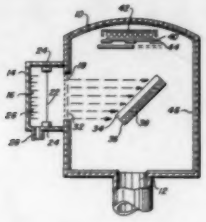
Filed Apr. 3, 1981, Ser. No. 254,341

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 S **27 Claims**

7. The method of producing semiconducting films on a substrate comprising generating a plasma, extracting, accelerating and directing an ion beam of said plasma toward a sputtering target comprising said semiconductor, said target being contained within a vacuum chamber at reduced pressure, sputtering said target with said ion beam to sputter the target material, shielding said vacuum chamber surface from stray ion

beams whereby sputtering of said vacuum chamber surface by said plasma is minimized, collecting said sputtered target material as a film on said substrate, said substrate being physically isolated from the plasma generating process and the sputtering process.



4,416,756

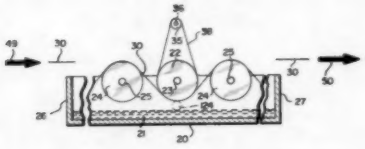
ELECTROTREATING APPARATUS WITH DEPLETABLE ANODE ROLL

Frank A. Martin, Merrillville, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Dec. 30, 1982, Ser. No. 454,616

Int. Cl.³ C25D *17/00*

U.S. Cl. 204—206 **14 Claims**



1. An apparatus for electrotreating a continuous metal strip, said apparatus comprising:

a depletable anode roll having an outer layer composed of plating metal, said outer layer having a peripheral surface;

another roll axially parallel to and spaced from said anode roll, said other roll having a peripheral surface;

a closed loop composed of electrically insulative, porous mesh having a plurality of mesh strands;

said porous mesh extending around a portion of the peripheral surface of each roll to form said closed loop;

some areas on said portion of the anode roll's peripheral surface being covered by said mesh strands and some areas being uncovered;

means mounting each of said rolls for rotation;

means, including each of said rolls, for moving each point on said porous mesh through a series of circuits along a predetermined path defined by said closed loop, in response to rotation of said depletable anode roll;

and means for assuring that different areas on the peripheral surface of said anode roll are left uncovered by said mesh strands on different circuits of said loop, to provide for relatively uniform erosion of said outer layer of the depletable anode roll during an electrolytic plating process.

4,416,757

COATED THERMOPLASTIC POLYMER DIAPHRAGMS AND A METHOD FOR THEIR PREPARATION

Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Dec. 22, 1978, Ser. No. 972,559

Int. Cl.³ C25B *13/08*

U.S. Cl. 204—252 **16 Claims**

1. An electrolyte permeable diaphragm for use in electrolytic processes comprised of a thermoplastic polymer coated with a fluorochemical resin water repellent comprised of a polymer or copolymer of a fluoroalkyl ester of an acid selected from the group consisting of acrylic acid and methacrylic acid, said fluoroalkyl group having from about 3 to about 15 carbon atoms.

2. The diaphragm of claim **1** in which said thermoplastic polymer is a polyolefin compound selected from the group consisting of olefins having from 2 to about 6 carbon atoms and their chloro- and fluoro-derivatives.

10. An electrolytic cell for the electrolysis of aqueous solutions of alkali metal chlorides employing the electrolyte permeable diaphragm of claim **2**.

4,416,758

GAS EXTRACTION

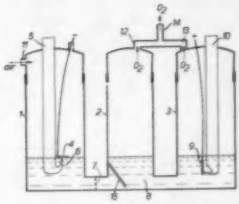
Alfred C. C. Tseung, 60 Grove Ave., London N. 10, and Sameer M. Jasem, 39 Langham Rd., London No. 15, both of England

Division of Ser. No. 137,114, filed as PCT GB 79/00060, Apr. 11, 1979, published as WO 79/00933, Nov. 15, 1979, § 102(e) date Nov. 5, 1979, Pat. No. 4,300,987. This application Jun. 22, 1981, Ser. No. 275,906

Claims priority, application United Kingdom, Apr. 14, 1978, 14752/78

Int. Cl.³ C25B *9/00, 11/12;* B01J *23/40*

U.S. Cl. 204—258 **18 Claims**



1. Oxygen extraction apparatus comprising at least one cell including a cathode for the reduction of oxygen by an electrochemical reaction thereby to produce peroxy ions, an anode adapted to regenerate oxygen, and said cell including, spaced apart from the cathode, means, other than the anode, for the catalytic decomposition of said peroxyl ions.

4,416,759

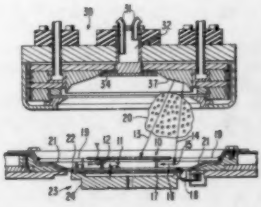
SPUTTER SYSTEM INCORPORATING AN IMPROVED BLOCKING SHIELD FOR CONTOURING THE THICKNESS OF SPUTTER COATED LAYERS

David J. Harra, Santa Cruz; Frederick T. Turner, Sunnyvale, and Martin A. Hutchinson, Santa Clara, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 27, 1981, Ser. No. 325,588

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **6 Claims**



1. A sputter system comprising an improved blocking shield for contouring the thickness of a sputter-deposited layer, said

sputter system including a target cathode, a substrate mounting means and a means for producing a plasma in said system, said improved blocking shield comprising:

a primary blocking shield structure positioned in said sputter system in between said target cathode and said substrate mounting means, said primary blocking shield being positioned in spaced adjacency to said substrate mounting means to shadow a portion of said substrate mounting means from line-of sight exposure to said target cathode, and

an ancillary blocking shield, said ancillary blocking shield positioned in said sputter system to form an extension of said primary blocking shield in the direction of said substrate mounting means, said ancillary blocking shield being displaced inwardly from the periphery of said blocking shield by a predetermined distance and spaced a predetermined distance above said substrate mounting means and serving to shield against the lateral movement of sputtered atoms which are redirected inwardly of the bottom edge of said primary blocking shield by gas scattering collisions.

4,416,760

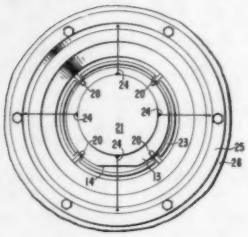
APPARATUS FOR ASYMMETRICALLY CONTOURING THE THICKNESS OF SPUTTER COATED LAYERS

Frederick T. Turner, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 27, 1981, Ser. No. 325,589

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **6 Claims**



1. In a cathode sputtering apparatus for producing an asymmetrically contoured sputter coated layer on a substrate mounted on a substrate mounting means located in opposition to a sputter source comprising a target cathode, and blocking shield means positioned inbetween said cathode target and said substrate, said blocking shield serving to block a portion of said substrate from line-of-sight communication with said target cathode, THE IMPROVEMENT COMPRISING:

said blocking shield being positioned asymmetrically and in a stationary location with respect to said substrate, said asymmetry being derived from the symmetry of said apparatus.

4,416,761

MULTI SLAB GEL CASTING ELECTROPHORESIS APPARATUS

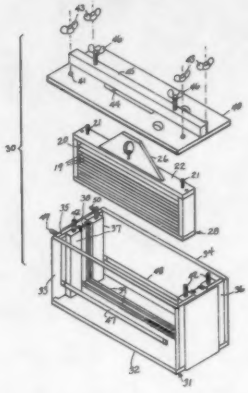
Glenn E. Brown, Baltimore; Timothy P. Karpetsky, Riderwood, and Phillip Jewett, Ridgely, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jul. 27, 1982, Ser. No. 402,353

Int. Cl.³ G01N *27/26*

U.S. Cl. 204—299 R **13 Claims**

1. A slab gel casting device for use in a two-dimensional electrophoresis system comprising a generally rectangular open frame-like rack, at least two elongated gel slab plates receivable longitudinally in said rack, the slab plate being formed adjacent one longitudinal edge thereof with grooves for receiving an elongated isoelectrically focussed polymerized disc gel to which sample is added and subsequently electrophoresed, means to clampingly hold the gel slab plates in the rack, a gel casting receptacle, supporting means in said gel casting receptacle formed to supportingly receive said rack



and to support the rack in an inclined position in the receptacle, and said clamping means comprising clamping plate means receivable in said rack beneath its top portion, and means engaged in the top portion of the rack and clampingly engageable with said clamping plate means.

4,416,762

ELECTROPHORETIC APPARATUS

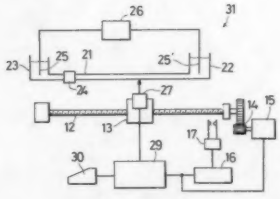
Junichi Akiyama, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Mar. 22, 1982, Ser. No. 360,765

Claims priority, application Japan, Jul. 31, 1981, 56-121018; Jul. 31, 1981, 56-121019

Int. Cl.³ B01D *13/02*

U.S. Cl. 204—299 R **8 Claims**



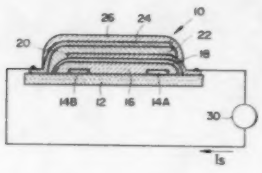
1. An electrophoretic apparatus including a sample introduction system and a measurement system arranged in this order in an electrophoretic column connected between terminal and leading electrolyte bathes which in turn are connected to both the ends of a high voltage power supply circuit, wherein the improvement resides in that said measurement system includes means for detecting zones of respective sample component ions at different instants of time, means for detecting the lengthes of zones detected, and operation means for comparing the lengthes of the two corresponding zones detected at different instants of time thereby to determine that the two zones are completely separate ones when separation of said zones is completed, wher their lengthes can be deemed to be equal, but otherwise the same as incompletely separate zones.

4,416,763

AIR/FUEL RATIO DETECTING DEVICE FOR USE IN EXHAUST GAS OF IC ENGINE

Takeshi Fujishiro, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 18, 1983, Ser. No. 467,879
Claims priority, application Japan, Feb. 27, 1982, 57-31525
Int. Cl.³ G01N 27/58; H01L 7/00
U.S. Cl. 204—412 8 Claims



1. An oxygen-sensitive air/fuel ratio detecting device for use in exhaust gas of an internal combustion engine, comprising:

a body of a semiconductive oxide of a transition metal;

a first pair of electrodes attached to the transition metal oxide body to measure the resistance of the transition metal oxide existing therebetween; and

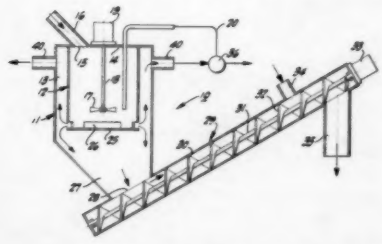
a combination of a microscopically porous layer of an oxygen ion conductive solid electrolyte and a second pair of electrodes attached to the solid electrolyte layer to make a DC current flow in the solid electrolyte layer from selected one of the second pair of electrodes to the other, said combination being arranged such that the exhaust gas comes into contact with the transition metal oxide body always by diffusion through the porous solid electrolyte layer and that the migration of oxygen ions in the solid electrolyte layer caused by the flow of said current takes place in substantially the same direction as the direction of said diffusion of the exhaust gas toward the transition metal oxide body or in substantially the reverse direction depending on the direction of the flow of said current.

4,416,764

METHOD AND APPRATUS FOR EXTRACTING TAR SAND

Benjamin J. Gikis, Los Altos Hills; Abner Y. Jones, Menlo Park, and Rudolf Elbrecht, Los Altos, all of Calif., assignors to Nutomas Energy Company, San Francisco, Calif.

Filed Nov. 28, 1980, Ser. No. 211,087
Int. Cl.³ B03B 5/36; C10G 1/04; C10C 1/18; B01D 11/02
U.S. Cl. 208—11 LE 11 Claims



1. A method of treating a mixture of sand and a solution of bitumen in a solvent, such mixture resulting from the extraction of tar sand with the solvent, the sand containing coarse particles and fine particles, such method comprising:

(a) providing an upwardly directed flow passage having an open bottom and having an outlet above and spaced from an open bottom,

(b) causing such mixture to flow in a substantially horizontal direction into such passage above its open bottom and below its outlet,

(c) causing upward flow of solution through such passage and through its outlet, and

(d) maintaining such flow at a rate such that coarse particles of sand will sink through the open bottom of the passage and fine particles of sand will travel with the solution through the passage and its outlet.

4,416,765

CATALYTIC CRACKING

Arthur W. Chester, Cherry Hill; William E. Cormier, Jr., Clarksboro, and William A. Stover, Woodbury, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 301,851, Sep. 14, 1981, Pat. No. 4,368,114, which is a continuation-in-part of Ser. No. 100,585, Dec. 5, 1979, Pat. No. 4,309,279, which is a continuation-in-part of Ser. No. 50,588, Jun. 1, 1979, abandoned. This application Aug. 16, 1982, Ser. No. 408,109
Int. Cl.³ C10G 11/05
U.S. Cl. 208—120 26 Claims

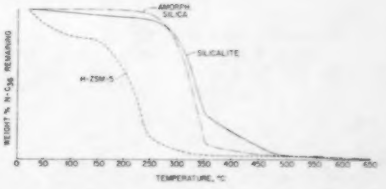
1. In a catalytic cracking process designed for cracking a petroleum fraction over an essentially entirely amorphous cracking catalyst comprising contacting said fraction with said amorphous cracking catalyst at a temperature of from about 400° F. to about 1300° F. to provide a product exhibiting a certain octane number, the improvement of contacting said fraction in said process at a temperature of from about 400° F. to about 1300° F. with a catalyst comprising a major amount of amorphous cracking component and a minor amount of crystalline zeolite component characterized by a Constraint Index of from about 1 to about 12 and a silica to alumina mole ratio of greater than about 12 whereby the product of said process exhibits an increased octane number when compared to the same process conducted with an essentially entirely amorphous cracking catalyst.

4,416,766

HYDROCARBON CONVERSION WITH CRYSTALLINE SILICATES

Bernard F. Mulaskey, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 144,473, Apr. 28, 1980, Pat. No. 4,309,275. This application Oct. 22, 1981, Ser. No. 313,562
The portion of the term of this patent subsequent to Jan. 5, 1999, has been disclaimed.
Int. Cl.³ C10G 11/05
U.S. Cl. 208—135 12 Claims

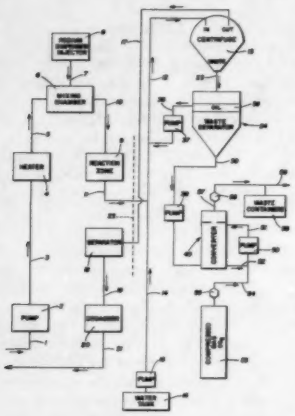


1. A process for producing olefins from normal paraffins, slightly branched paraffins, and mixtures thereof, comprising contacting a feed which comprises said paraffins with a crystalline silicate having a uniform pore structure, having a pore size such that p-xylene can be adsorbed into said pore structure and o-xylene cannot, and having a silica/alumina mole ratio greater than about 200:1; and, producing an effluent of greater olefin content than said feed.

4,416,767
METHOD AND APPARATUS FOR THE REMOVAL OF EXCESS SODIUM REAGENT AND BYPRODUCTS OF REACTION PRODUCED DURING THE DESTRUCTION AND REMOVAL OF POLYCHLORINATED BIPHENYLS FROM OIL

Otis D. Jordan, North Canton, Ohio, assignor to Sun-Ohio, Inc., Canton, Ohio

Filed Nov. 16, 1981, Ser. No. 322,018
Int. Cl.³ C10G 29/04; C02F 1/70, 1/38, 1/40
U.S. Cl. 208—262 **19 Claims**



1. A method for the continuous removal of an excess sodium reagent and byproducts of reaction produced during the destruction and separation of polychlorinated biphenyl from a contaminated transformer oil in which said byproducts include sodium chloride and polyphenyl polymer, said method including the steps of:

(a) providing a continuous flow of the decontaminated oil containing the excess sodium reagent and byproducts of reaction produced during the destruction of the polychlorinated biphenyl in the contaminated transformer oil;

(b) continuously mixing a predetermined quantity of water with the oil, sodium reagent and byproducts to form an aqueous mixture containing oil, sodium hydroxide and sodium chloride, said quantity of water being continuously sufficient to convert all of the excess sodium to sodium hydroxide and to dissolve and hold in solution said sodium hydroxide;

(c) continuously supplying said aqueous mixture to a centrifuge;

(d) continuously removing the separated oil from the centrifuge; and

(e) removing the waste aqueous mixture remaining in the centrifuge after removal of the oil from the centrifuge for subsequent disposal.

4,416,768
ORE BENEFICIATION

Sami S. Nosseir, Port Cartier, Canada, assignor to Quebec Cartier Mining Company, Montreal, Canada

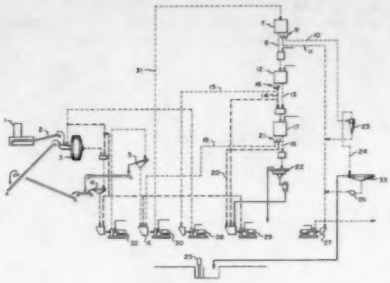
Filed Apr. 2, 1982, Ser. No. 365,063
Int. Cl.³ B03B 5/52
U.S. Cl. 209—3 **11 Claims**

1. Method of processing ore comprising

(A) grinding and screening said ore to a size containing a significant portion of locked middlings,

(B) separating the screened undersize in a rougher spiral to obtain a low-value tailing and a concentrate which includes a major portion of locked middlings,

(C) passing the concentrate therefrom including the locked middlings to a cleaner spiral for separation into (i) a cleaner concentrate and (ii) a cleaner tailing, the cleaner tailing comprising (a) a cleaner water fraction and (b) a cleaner sand fraction predominating in locked middlings,



(D) recycling the cleaner sand fraction for regrinding, and

(E) further processing the cleaner concentrate to obtain a final product.

4,416,769
FROTH FLOTATION

David J. A. McCaffrey, Cheltenham, England, and William D. Jones, deceased, late of Tewkesbury, England (by Barbara Jones, legal representative), assignors to Coal Industry (Patents) Limited, London, England

Filed Dec. 24, 1981, Ser. No. 334,237
Int. Cl.³ B03D 1/14
U.S. Cl. 209—166 **5 Claims**

1. A method of treating coal by froth flotation comprising the operation of a froth flotation cell using a "collector" consisting essentially of a paraffinic residual oil having a cut point of at least 190° C. at atmospheric pressure and which has less than 10% of aromatics and less than 10% of naphthenes therein, by weight and recovering coal in the froth.

4,416,770
SELECTIVE MINERAL RECOVERY

Clarence R. Bresson, and Robert M. Parlman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 28, 1982, Ser. No. 383,370
Int. Cl.³ B03D 1/14
U.S. Cl. 209—167 **8 Claims**

5. A froth flotation process wherein a pulp of flotation fluid and an ore comprising a sulfide selected from the group consisting of sulfides of iron and copper and comprising a sulfide selected from the group consisting of sulfides of lead and zinc is admixed with a gaseous stream to generate a mineral containing froth and wherein said sulfide selected from the group consisting of sulfides of copper and iron is recovered from said froth,

the improvement comprising:

incorporating into said pulp a depressant comprising beta-mercaptoethanol in an amount conducive to the suppression of said sulfide selected from the group consisting of sulfides of lead and zinc.

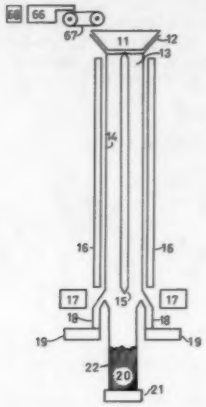
4,416,771
MINE ORE CONCENTRATOR

Lance L. Henriques, 15 Claremont Ave., New York, N.Y. 10027

Filed May 23, 1981, Ser. No. 256,688
Int. Cl.³ B03C 1/14
U.S. Cl. 209—224 **7 Claims**

1. An ore or particle concentrator comprising means form-

ing an elongated generally cylindrical separating chamber containing a supply of liquid, a first elongated core centrally fixed in said chamber and charged with high frequency current so as to establish a generally radially, outwardly extending magnetic field in said liquid, a second elongated core of generally annular form positioned radially outwardly of said chamber and also charged with current so as to establish a generally inwardly extending magnetic field, ore or particle supply



means positioned above said chamber and adapted to distribute material to be separated across the upper end of said chamber, the fields generated by said first and second cores coacting to move influenced metal components of the material radially outwardly toward the outer wall of the chamber, while relatively uninfluenced material particles continue axially down, and means to separately remove and collect both such components from the separating chamber.

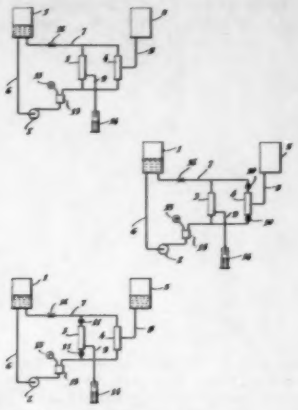
4,416,772

APPARATUS FOR CONCENTRATING AND FILTERING BODY CAVITY FLUIDS

Takashi Sato, Kanazawa; Makoto Mukai, Fukui; Shiro Nagata, Kurashiki; Yoshimichi Harada, Okayama, and Yasuzo Kirita, Toyonaka, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jul. 24, 1981, Ser. No. 286,625
Claims priority, application Japan, Aug. 4, 1980, 55-107331
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—137 **4 Claims**

1. A body cavity fluid treating apparatus which comprises a first container (1) for holding a body cavity fluid, a second container (5) for holding a concentrated body cavity fluid freed from bacteria, a pump (2) for drawing out the body cavity fluid from said first container, a concentrator (3) for concentrating the body cavity fluid, a filter (4) for filtering the body cavity fluid which has been concentrated in said concentrator, a first flow path (6) connecting said first container with the body cavity fluid inlet of the concentrator and with the body cavity fluid inlet of the filter by means of a branched tube, a second flow path (7) connecting the body cavity outlet of the concentrator and the body cavity fluid outlet of the filter, respectively, with said first container by means of a branched tube, a third flow path (8) connecting the filtrate outlet of the filter with said second container, a fourth flow path (9) connected to the filtrate outlet of the concentrator, means for closing, during the period of body cavity fluid concentration, those branches of the branched tubes in the first and second flow path which are connected to the inlet and outlet of the filter, respectively, and closing, during the period of body cavity fluid filtration, those branches of the branched tubes in said same flow path which are connected to the inlet and outlet



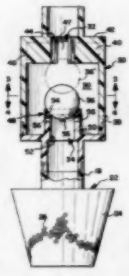
of the concentrator, respectively, and a pressure adjusting means provided in the second circuit.

4,416,773

VALVE MECHANISM FOR MULTIPLE DISTRIBUTOR FLUID TREATMENT SYSTEM

Stephen H. Davis, Middletown, and Daniel W. Simpson, Fairfield, both of Ohio, assignors to Water Refining Company, Inc., Middletown, Ohio

Filed Feb. 22, 1982, Ser. No. 350,710
Int. Cl.³ B01D *23/20*
U.S. Cl. 210—289 **7 Claims**



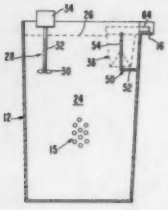
1. In a fluid treatment device of the type having a tank defining a treatment bed, particulate treatment material contained within said treatment bed, and a central distribution tube mounted in said bed and terminating in a plurality of distribution means, said distribution means providing fluid communication between said bed and said tube, the improvement wherein each of said distribution means comprises:

valve means having unidirectional flow restriction means such that fluid flow in a first direction from said bed through each of said distribution means to said central distribution tube is relatively unrestricted by said flow restriction means, and fluid flow in a second direction from said central distribution tube through each of said distribution means to said bed is reduced but not eliminated by said fluid restricton means.

4,416,774
PARTICLE SEPARATING SCREEN UNIT FOR AGITATION TANK

Allan D. Taylor, Walnut Creek, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Feb. 12, 1982, Ser. No. 348,535
Int. Cl.³ B01D *15/00*
U.S. Cl. 210—236 **14 Claims**

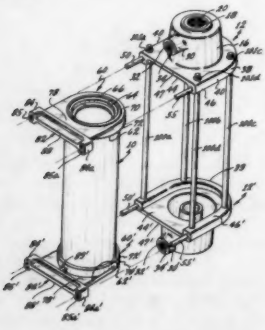


1. Apparatus for use in separating metal and other values from a slurry by adsorption with particles comprising: a tank for holding a slurry containing the values to be separated and a number of particles on which the values are to be absorbed, said tank having an outlet stub launder; a screen unit for the tank, said screen unit including a hollow body provided with an outer side opening and a screen across the side opening to permit slurry flow into the interior of the body; and means on the tank for removably mounting the screen unit in the tank in an operative position near the outlet stub launder thereof, said screen unit having a stub launder removably receivable in the outlet stub launder of the tank when the screen unit is in said operative position, said outlet stub launder being adapted for directing the slurry out of the tank after the slurry has passed through the screen unit, the screen of the screen unit being of a mesh sufficient to permit the slurry to pass from the tank into the screen unit and to prevent particles in the tank from entering the screen unit.

4,416,775
IN-LINE FILTER AND CARTRIDGE THEREFOR

Frank Halbich, Granada Hills, and Jeffrey L. Greene, New Hall, both of Calif., assignors to STD Filter Company, Inc., Sylmar, Calif.

Filed Dec. 14, 1981, Ser. No. 330,094
Int. Cl.³ B01D *27/08*
U.S. Cl. 210—236 **9 Claims**

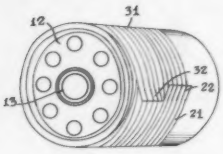


1. A filter assembly comprising in combination a casing having ends and containing a filter cartridge, an end fitting at each end of the casing, means holding the end fittings together including holding rods extending between the end fittings, each end fitting including a laterally moveable slide member having a surface formed for sealing engagement with a surface of the end fitting and having an opposite side conformed for sealing engagement with the end of the said casing, and means whereby the slide members with the casing and cartridge can be removed from the unit without breaking connections to the end fittings the slide members remaining sealed to the ends of the casing.

4,416,776
OIL FILTER CONSTRUCTION

Larry G. Brundidge, 481 45th Pl., NE., Salem, Oreg. 97301

Filed Jul. 26, 1982, Ser. No. 401,677
Int. Cl.³ B01D *00/00*
U.S. Cl. 210—238 **8 Claims**



1. An improved construction for spin-on type oil filter cylinders having an open end, and a closed end; wherein the improvement comprises:

a first elongated strip of material releasably secured to the cylinder body; wherein the said first strip of material is wrapped a plurality of times around the cylinder body in the clockwise direction, and the removal of said first elongated strip of material from the filter body will tend to impart a rotary movement of the filter body in a counter-clockwise direction, and

a second elongated strip of material releasably secured to the cylinder body; wherein the said second strip of material is wrapped a plurality of times around the cylinder body in the counter-clockwise direction, and the removal of said second elongated strip of material from the filter body will tend to impart a rotary movement of the filter body in a clockwise direction,

each of the said strips of material is coated with an adhesive on its underside.

4,416,777
SEPARATION OF LEUKOCYTES OR LYMPHOCYTES FROM LEUKOCYTE-CONTAINING SUSPENSION

Toru Kuroda, Fuji; Yoshinori Takenaka, Saitama, and Nobuaki Tsuda, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 3, 1980, Ser. No. 193,571
Claims priority, application Japan, Oct. 9, 1979, 54-129482
Int. Cl.³ B01D *39/02, 37/02*
U.S. Cl. 210—446 **19 Claims**

1. A material for separating leukocytes from a leukocyte-containing suspension, which comrises a fibrous material having a surface layer coated on the fibrous material, said surface

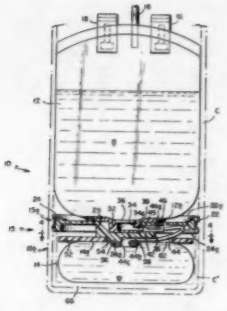
layer consisting essentially of a substance which is capable of being dissolved by degrees in water at a dissolution rate in water of from 0.3 to 1.0 mg/min-cm^2 at a temperature of 30° C.

4,416,778

MEANS FOR PREPARING NEOCYTE ENRICHED BLOOD

Charles H. Rogers, Duxbury, Mass., assignor to Neocyte, Inc., Rockland, Mass.

Filed Oct. 20, 1981, Ser. No. 313,343
Int. Cl.^{3} B01D *21/26*
U.S. Cl. 210—516 **18 Claims**



1. Apparatus for preparing neocyte-enriched blood comprising

A. means defining a first chamber,

B. means defining a second chamber, said chamber-defining means being adapted for mounting in a centrifuge for spinning therewith and having a spinning position,

C. a conduit connecting the interiors of the two chambers said conduit being positioned at the radially outer portion of said first chamber-defining means in said spinning position,

D. means for introducing a liquid into the first chamber,

E. valve means carried by the chamber-defining means and having a seated position blocking said conduit and an unseated position opening said conduit, and

F. means for seating the valve means when the chamber-defining means are subjected to centrifugal force of predetermined magnitude developed by said spinning for preventing liquid flow from the first to the second chamber as the components of the liquid are distributed in the first chamber along a density continuum and for unseating the valve means when the centrifugal force developed by said spinning drops below said predetermined magnitude to permit the flow of a selected volume of liquid from the first to the second chamber.

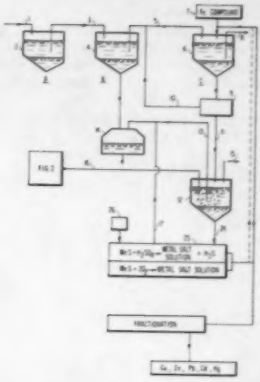
4,416,779

METHOD FOR PRODUCING AN AQUEOUS SOLUTION OF HIGH PHOSPHOROUS CONTENT

Wilhelm K. Ripl, Bernadollestrasse 72, 1000 Berlin 33, Fed. Rep. of Germany, and Bo L. Verner, Belgielei 127, 2000 Antwerpen, Belgium

Filed Sep. 28, 1982, Ser. No. 425,779
Claims priority, application Sweden, Nov. 24, 1981, 8106992
Int. Cl.^{3} C02F *3/28*
U.S. Cl. 210—603 **5 Claims**

1. A method for producing an aqueous solution of high phosphorous content, and for recovering metal compounds in a plant for purifying sewage-water or raw-water, said plant including at least one chemical treatment stage in which an iron compound is introduced into the sewage-water or raw-water to produce a chemical aqueous sludge containing precipitated phosphorous, the improvement which comprises treating the chemical aqueous sludge formed in the chemical treatment stage with hydrogen sulphide in a subsequent treatment stage under anaerobic conditions to dissolve the phosphorous in the water and to form a sludge containing metal sulphide, conducting away the resultant phosphorous-containing water;



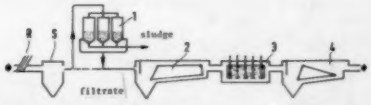
dissolving the metal sulphides to form metal salt solutions by adding a strong acid to the metal sulfide-containing sludge; and separating at least an iron salt solution of the metal salt solutions and recycling said iron salt solution to the chemical treatment stage.

4,416,780

METHOD TO UPGRADE SEWAGE TREATMENT PLANTS OVERLOADED IN CONTINUOUS OPERATION

Dieter Disselbeck, Bad Soden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 969,842, Dec. 15, 1978, abandoned. This application Dec. 9, 1981, Ser. No. 329,080
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1977, 2756171
Int. Cl.^{3} C02F *3/04*
U.S. Cl. 210—617 **4 Claims**



1. A method of increasing the capacity of an existing sewage treatment plant comprising passing by means of gravity at least a portion of waste water through a filter device arranged (1) prior to or (2) subsequent to or (3) prior and subsequent to a conventional treatment stage of said sewage treatment plant stage, said filter device being at least one suspended, tube-like woven fabric filter element and an inner filter layer of solids resulting from solids separated during the filtration process from the waste water along the woven fabric filter thus water passes through the filter wall while separating by and in the filter layer (a) solid particles, (b) colloidal components and (c) soluble components to obtain a effluent filtrate with an increased oxygen content.

4,416,781
TREATMENT OF BIOLOGICALLY-DEGRADABLE WASTE

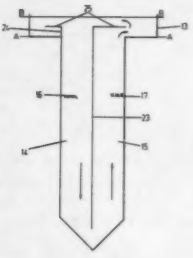
Martin Bailey, Norton; David A. Hines, Liverpool; John C. Ousby, Norton, all of England; Frank C. Roesler, deceased, late of Norton, England, and by Johanna M. Roesler, executrix, Cambridge, England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 213,596, Dec. 5, 1980, Pat. No. 4,351,730, which is a continuation of Ser. No. 882,224, Feb. 28, 1978, abandoned, which is a continuation of Ser. No. 467,511, May 6, 1974, abandoned. This application Jun. 14, 1982, Ser. No. 386,186

Claims priority, application United Kingdom, May 16, 1973, 23328/73; Nov. 21, 1973, 53921/73

Int. Cl.³ C02F *3/22, 3/26*

U.S. Cl. 210—629 22 Claims



1. A post start-up method for the continuous treatment of sewage by the activated sludge technique utilising a circulatory system which includes a downcomer, a riser, and a basin, the lower ends of the riser and downcomer being connected directly to form a closed zone and their upper ends being operably connected through the basin, the method comprising performing the following steps in a continuous manner.

(a) circulating a sludge-containing liquid round the circulatory system so that it flows down the downcomer, into the riser, up the riser, and, from the upper end of the riser, back into the downcomer via passage through the basin,

(b) introducing a gas containing free oxygen into the downcomer,

(c) disengaging gas from the liquid in the basin before it is recycled back to the downcomer,

(d) feeding sewage into the circulatory system, and

(e) discharging part of the liquid from the circulatory system,

the liquid being circulated at such a rate that

(i) the velocity of the liquid down the downcomer is at least sufficient to entrain substantially all of the gas introduced into the downcomer so that the entrained gas flows concurrently down the downcomer with the liquid, and said liquid, along with entrained gas, at least some of which will dissolve as the liquid descends the downcomer, is transferred at the lower end of the downcomer into the riser, and

(ii) the time taken for one circulation of the liquid around the circulatory system is at least 2 minutes, and the rates at which said sewage is fed to the circulatory system and said liquid is discharged from the circulatory system being such that the average residence time of the sewage in the circulatory system

(iii) corresponds to a plurality of circulations of said liquid round the circulatory system, and

(iv) is at least about one quarter hour.

4,416,782
METHOD FOR SEPARATING OIL FROM AQUEOUS OR SOLVENT DISPERSIONS

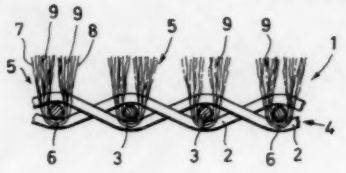
Bruno Kerres, Nettetal, Austria, assignor to Girmes-Werke AG, Fed. Rep. of Germany

Continuation of Ser. No. 215,371, Dec. 11, 1980, abandoned. This application Mar. 18, 1982, Ser. No. 359,190

Claims priority, application European Pat. Off., Dec. 12, 1979, 79105115.4

Int. Cl.³ B01D *17/04*

U.S. Cl. 210—634 7 Claims



1. A method for separating oil from oil bearing aqueous or solvent liquid dispersions wherein the oil has a lower density than the liquid dispersions, said method being characterized in that an oil containing liquid disperson is passed through a porous textile flat-shaped article having upstanding free ended piles formed at least partly of oleophilic fibers each having a titer between 0.05 and about 0.5 dtex whereby very small oil drops having a diameter of about 1 to 30 microns in the dispersions are withheld on the oleophilic fibers and coalesce to larger oil droplets which rise to the surface of the liquid dispersions due to their lower density than the liquid dispersions, the said porous textile article being thereby continuously and automatically cleaned by said coalescence from oil agglomerations, so that the fibers are always prepared for new coalescing actions.

4,416,783
LIQUID CHROMATOGRAPHY COLUMN, PROCESS FOR PREPARING THE SAME AND ITS USE FOR FRACTIONATION

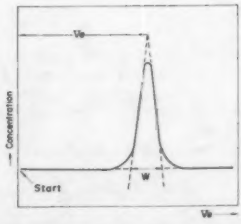
Kohji Noguchi, and Masao Kasai, both of Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 20, 1982, Ser. No. 341,040

Claims priority, application Japan, Feb. 12, 1981, 56-17985

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—635 18 Claims



18. A method of blood component analysis which comprises developing blood serum on a liquid chromatography column comprising a high packing ratio of gel bed of a totally porous polymer containing vinyl alcohol units and having a weight average grain diameter of 4 to 20 μm, and wherein the gel bed has a uniformity degree of 2.0 to 4.0, said uniformity degree

being defined by HETP/Dp, in which HETP represents the height equivalent to a theoretical plate of the column and Dp represents the weight average grain diameter of the polymer.

4,416,784

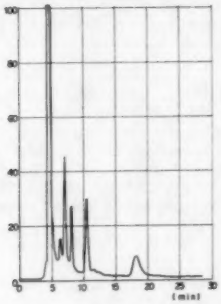
FILLING COMPOSITION FOR USE IN LIQUID CHROMATOGRAPHY

Masaaki Nakao, Kunitachi, and Fumio Kodama, Chofu, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Continuation-in-part of Ser. No. 116,215, Jan. 28, 1980, abandoned. This application Feb. 23, 1982, Ser. No. 351,350

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—635 6 Claims



1. A method for analytically examining a physiological specimen by liquid column chromatography comprising the steps of:

(a) stabilizing a column comprised of bead-like hydroxymethylated copolymer of styrene and divinylbenzene by passing a phosphate buffer solution or citrate buffer solution in the range of pH 6.5 to 8.0 through the column at a temperature of 5° to 70° C.;

(b) further stabilizing the column by passing an aqueous solution of serum protein containing 0.2 to 5.0% by weight of said serum protein through the column at a temperature of 5° to 70° C. wherein the serum protein is absorbed onto the column; and

(c) passing the physiological specimen to be examined through the buffer and protein stabilized column at a temperature of 20° to 40° C. in order to examine the specimen.

4,416,785

SCALE-INHIBITING COMPOSITIONS OF MATTER

Russell O. Menke, Valenica, and Michael Bortnik, Los Angeles, both of Calif., assignors to UOP Inc., Des Plaines, Ill.

Filed May 17, 1982, Ser. No. 379,209

Int. Cl.³ C02F *5/12, 5/14*

U.S. Cl. 210—699 7 Claims

1. A composition of matter for inhibiting the formation of scale in a fluid system which is exposed to an aqueous stream which comprises an alkaline mixture of polyvinyl pyrrolidone and aminotri(methylene phosphonic acid).

4,416,786

PROCESS FOR THE TREATMENT OF CONTINUOUS WASTE WATER STREAMS HAVING CHANGING CONTENTS OF DIFFERENT OXIDIZABLE MATERIALS WITH HYDROGEN PEROXIDE

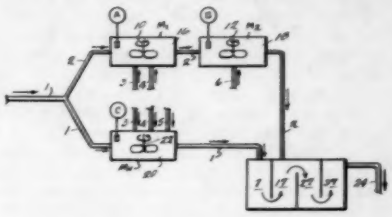
Helmut Knorre, Seligenstadt; Joachim Fischer, Rodenbach, and Klaus Stützel, Frankfurt, all of Fed. Rep. of Germany, assignors to Degussa, Frankfurt, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 392,464

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1981, 3125452

Int. Cl.³ C02F *1/72*

U.S. Cl. 210—746 20 Claims



1. A process for the treatment of a continuous main waste water stream having a varying content of different oxidizable materials with hydrogen peroxide for the purpose of detoxification and reduction of the chemical oxygen demand and biological oxygen demand, comprising diverting a small portion of the main waste water stream to form a side stream and controlling the amount of hydrogen peroxide added to the main stream by ascertaining the oxidizing agent demand in the side stream by:

(a) adjusting the pH of the waste water by dosing of alkali or acid continuously to a constant pH value between 3 and 12,

(b) continuously measuring the redox potential with a platinum, silver, gold, or ion selective electrode and a reference electrode and dosing an aqueous solution of a strong oxidizing agent acting more quickly than H_2O_2 under comparable conditions until the desired redox value is reached corresponding to the sought breakdown of the toxic material, and then always when the strong oxidizing agent is dosed into the side stream simultaneously adding into the main stream proportional amounts of H_2O_2 and any necessary further chemicals.

4,416,787

SOIL RESISTANT YARN FINISH FOR SYNTHETIC ORGANIC POLYMER YARN

Robert M. Marshall, Chester; William A. Archie, Petersburgh, and Kimon C. Dardoufas, Richmond, all of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 1, 1982, Ser. No. 437,977

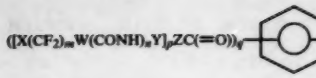
Int. Cl.³ D06M *13/46*

U.S. Cl. 252—8.8 30 Claims

1. A yarn finish composition comprising:

a. 15 to 80 weight percent of a quaternary ammonium salt selected from the group consisting of alkyl dodecyl ammonium salt and cocotrialkyl ammonium salt, wherein the alkyl is methyl or ethyl and the anion of the salt is selected from the group consisting of chloride, bromide, iodide, sulfate, ethosulfate, methosulfate and mixtures thereof; and

b. 20 to 85 weight percent of a fluorochemical compound having the formula



wherein the attachment of the fluorinated radials and the radicals CO_2B to the nucleus is in asymmetrical positions with respect to rotation about the axis through the center of the nucleus; wherein "X" is fluorine, or perfluoroalkoxy of 1 to 6 carbon atoms, and m has arithmetic mean between 2 and 20; n is zero or unity; "W" and "Y" are alkylene, cycloalkylene or alkyleneoxy radicals of combined chain length from 2 to 20 atoms; $(CF_2)_m$ and "Y" have each at least 2 carbon atoms in the main chain; "Z" is oxygen and p is 1, or "Z" is nitrogen and p is 2; q is an integer of at least 2 but not greater than 5; "B" is CH_2RCHOH or is $CH_2RCHOCH_2RCHOH$ where "R" is hydrogen or methyl, or "B" is $CH_2CH(OH)CH_2Q$ where Q is halogen, hydroxy, or nitrile; or "B" is $CH_2CH(OH)CH_2OCH_2$-$CH(OH)CH_2Q$; and r is an integer of at least 1 but not greater than q; and $X(CF_2)_m$, W and Y are straight chains, branched chains or cyclic; and wherein the substituent chains of the above general formulas are the same or different.

4,416,788

METAL CUTTING OIL AND METHOD FOR USING SAME

Dominic A. Apikos, Crown Point, Ind., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Oct. 13, 1981, Ser. No. 310,359

Int. Cl.³ C10M *1/38, 1/26*

U.S. Cl. 252—31 **24 Claims**

1. A lubricating oil composition comprising a major amount of mineral oil of lubricating viscosity; a minor, effective amount of at least one added sulfur-containing compound; a minor, effective amount of elemental sulfur, said sulfur-containing compound and said elemental sulfur being present each individually in an amount soluble in said composition at 40° F. and being present in combination in an amount effective to improve the extreme pressure properties of said composition and a minor, effective amount of at least one ester component to improve the lubricity of said composition and to increase the solubility of elemental sulfur in said composition, said composition being transparent.

4,416,789

HIGH DENSITY INFORMATION DISC LUBRICANTS

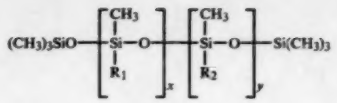
Igal Shidlovsky, Princeton, N.J., and William E. Harty, Levittown, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,535

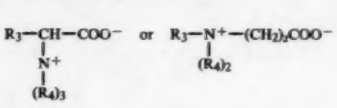
Int. Cl.³ B32B *3/02*; C10M *3/44*

U.S. Cl. 252—34.7 **8 Claims**

1. In a high density information record adapted for use with a playback stylus to effect recovery of signals occupying a bandwidth of at least several megahertz when relative motion at a desired rate is established between said record and said stylus, said record comprising a disc of a conductive material containing an information track constituted by a surface relief pattern in said track to accommodate recovery of signals of said bandwidth upon establishment of relative motion at said rate, said record coated with a methyl alkyl siloxane lubricant having the formula



wherein R_1 and R_2 are alkyl groups of 4–20 carbon atoms, x is an integer of 2–4, y is an integer of 0–2 and wherein the sum of x plus y is 4 or less, the improvement which comprises adding to said lubricant a long chain alkyl substituted betaine selected from the group consisting of



wherein R_3 is a long chain alkyl group of 6–20 carbon atoms, R_4 is hydrogen or alkyl of 1–3 carbon atoms and z is an integer.

4,416,790

PASTE-LIKE DAMPING MEDIUM AND METHOD FOR ITS MANUFACTURE

Helmut Schürmann, Dachau, and Erich Brand, Munich, both of Fed. Rep. of Germany, assignors to Schiedel GmbH & Co., Munich, Fed. Rep. of Germany

Filed Mar. 3, 1982, Ser. No. 354,248

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1981, 3107996

Int. Cl.³ C04B *43/00*; C10M *5/04*

U.S. Cl. 252—62 **20 Claims**

1. A paste-like damping medium for damping mechanical and/or acoustic vibrations, based on a liquid phase of silicone oil, polyglycol, mineral oil and/or a thermally-stable saturated aliphatic or aromatic carboxylic acid ester, a wetting agent and an agent for stabilizing the intrinsic viscosity, characterized in that it contains approximately 20 to approximately 80% by weight of at least one solid, 80% of which has a particle size of <20 μm, selected from the group comprising aluminum oxide, aluminum hydroxide, aluminum carbonate, aluminum triphosphate, aluminum silicate, cryolite, barium sulfate, calcium carbonate, calcium hydroxide, calcium triphosphate, calcium fluoride, magnesium oxide, magnesium carbonate, magnesium silicate, magnesium-aluminium silicate, magnesium stearate, lithium stearate, molybdenum sulfide, silicon dioxide, sillimanite, titanium dioxide, zinc sulfide, zinc pyrophosphate and polytetrafluoroethylene, approximately 0.1 to 4% by weight of a wetting agent, approximately 0.5 to 10% by weight of a finely-divided stabilizer of the intrinsic viscosity of at least one member separately selected from the group consisting of magnesium silicate, magnesium-aluminum silicate, aluminum silicate and silicic acids, and approximately 0.1 to 5% by weight of an antioxidant, the % weight being based in each case on the total weight of the damping medium.

4,416,791

PACKAGING FILM AND PACKAGING OF DETERGENT COMPOSITIONS THEREWITH

Zia Haq, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Oct. 28, 1982, Ser. No. 437,390

Claims priority, application United Kingdom, Nov. 11, 1981, 8133992

Int. Cl.³ C11D *17/00*

U.S. Cl. 252—90 **21 Claims**

1. A package consisting wholly or partially of plastics film material at least partially soluble in water, wherein said film is provided on its inside surface with a protective layer, in partic-

ulate form, of an inert plastics material having a contact angle to water of at least 80°, whereby said inside surface is protected

from attack by aqueous media while said film on its outside surface is vulnerable to attack by aqueous media.

4,416,792

IMINODIPROPIONATE CONTAINING DETERGENT COMPOSITIONS

Paul C. Blackstone, Collingswood, N.J., assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 320,390, Nov. 12, 1981, Pat. No. 4,375,422. This application Sep. 17, 1982, Ser. No. 419,357

The portion of the term of this patent subsequent to Mar. 1, 2000, has been disclaimed.

Int. Cl.³ C11D *1/10, 1/83, 3/075, 11/02*

U.S. Cl. 252—110 **10 Claims**

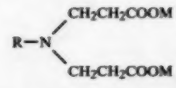
1. An aqueous detergent slurry composition having a solids content of about 55 to about 75% by weight consisting essentially of:

(a) about 10%–60% builder;

(b) about 2%–25% nonionic surfactant;

(c) 0% to about 30% other ingredients;

(d) an effective amount to substantially prevent separation of the nonionic from the detergent composition of a surface active iminodipropionate of the general formula:



wherein R is an alkyl, hydroxyalkyl or alkoxyalkyl group containing from about 10 to about 18 carbon atoms and M is an alkali metal cation; and

(e) the remainder water whereby said nonionic does not undergo substantial separation from said composition.

4. A detergent composition according to claim 1 wherein said other ingredient is selected from one or more of the following: soaps, suds stabilizers, coloring dyes, organic solvents, fluorescent dyes, co-surfactants, carboxymethylcellulose, enzymes, neturalized copolymers of ethylene and maleic anhydrides and perfumes.

4,416,793

LIQUID DETERGENT COMPOSITIONS CONTAINING AMINO-SILANES

Christian R. Barrat; John R. Walker, both of Brussels, and Jean Wevers, Strombeek-Bever, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 22, 1982, Ser. No. 421,187

Claims priority, application United Kingdom, Sep. 25, 1981, 8129069

Int. Cl.³ C11D *9/36, 3/30*

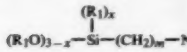
U.S. Cl. 252—117 **6 Claims**

1. A liquid detergent composition having improved machine compatibility, particularly in relation to enamel-coated surfaces, comprising:

(a) from 5% to 60% by weight of a synthetic organic surface-active agent;

(b) from 0% to 40% by weight of a detergent builder;

(c) from 0.001% to 1% by weight of an amino-silane having the formula

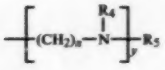


R_1=C_{1-4}-alkyl or C_{1-4}-hydroxyalkyl;

x is 0 or 1;

m is 1–6;

R_3 is hydrogen, R_1, C_{1-6}-alkylamine,

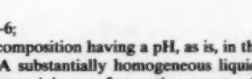


R_4 is hydrogen or R_1;

n is 1–6;

y is 0–6;

R_5=R_4,



p=1–6;

said composition having a pH, as is, in the range from 6 to 12.

5. A substantially homogeneous liquid detergent composition containing surface-active agents, fatty acid soaps and other conventional detergent additives, characterized in that it contains:

(a) from 20% to 40% by weight of a mixture of anionic surface-active agents and nonionic surface-active agents in a weight ratio of from 4:1 to 1:4;

(b) from 10% to 25% of a C_{12}–C_{18} fatty acid soap; and

(c) from 0.01 to 0.5 of the amino-silane in accordance with claim 1;

said composition having a pH, measured as is, in the range from 7 to 9.

4,416,794

RINSE AID COMPOSITIONS CONTAINING AMINO-SILANES

Christian R. Barrat; John R. Walker, both of Brussels, and Jean Wevers, Strombeek-Bever, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 22, 1982, Ser. No. 421,185

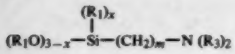
Claims priority, application United Kingdom, Sep. 25, 1981, 81/29067

Int. Cl.³ C11D *3/30*

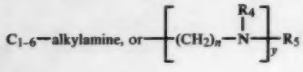
U.S. Cl. 252—174.15 **6 Claims**

1. A liquid rinse aid composition for use in an automatic dishwashing machine comprising from 1–40% by weight of a low foaming ethoxylated nonionic surfactant, from 0–30% by

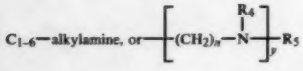
weight of an organic chelating agent and a hydrotrope-water solubilising system characterised in that the composition comprises from 0.05–10% by weight of an amino-silane of the general formula:



R_1 = C_{1-4}-alkyl or C_{1-4}-hydroxyalkyl;
x is 0 or 1;
m is 1–6;
R_3 is hydrogen, R_1,



R_5
R_4 is hydrogen or R_1;
n is 1–6;
y is 0–6;
R_5 = R_4,



p = 1–6.

4,416,795

MIXTURES OF OPTICAL BRIGHTENERS

Thomas Martini, Kelkheim; Hans Frischkorn; Erich Schinzel, both of Hofheim am Taunus, and Heinz Probst, Sulzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,561

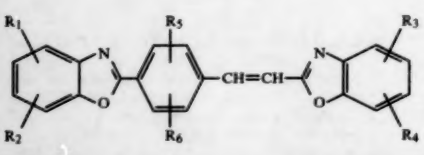
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1981, 3104992

Int. Cl.³ C09K *11/06*

U.S. Cl. 252—301.23 **5 Claims**

1. A mixture of optical brighteners, which contains

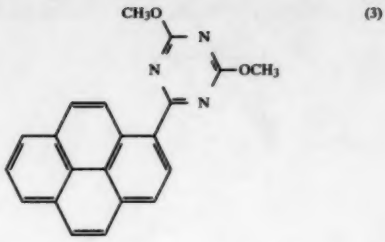
(a) 1 to 99% by weight of one or more compounds of the formula (1)



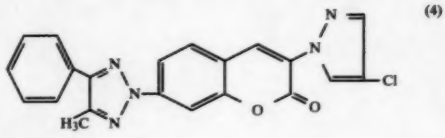
(1)

wherein R_1, R_2, R_3, R_4, R_5 and R_6 can be identical or different and denote hydrogen, chlorine, C_1–C_4-carbalkoxy, C_1–C_4-alkyl or C_1–C_4-alkoxy and

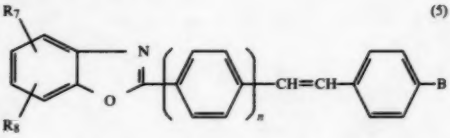
(b) 99 to 1% by weight of one or more compounds of the formulae



(3)

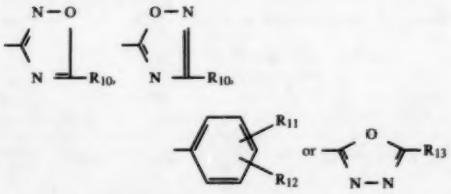


(4)



(5)

in which n denotes 0 or 1, R_7 and R_8 denote identical or different radicals from the group comprising hydrogen, fluorine, chlorine, phenyl, trifluoromethyl, C_1–C_4-alkyl, alkoxy, cyano, carboxyl, carboalkoxy, carboxamide and alkyl sulfonates, and two adjacent radicals R_7 and R_8 together can also represent a benzene ring, a lower alkylene group or a 1,3-dioxapropylene group, B denotes cyano, a group of the formula —$COOR_9$ or $CONR_9R_9$, in which R_9 denotes hydrogen, C_1–C_{18}-alkyl, cycloalkyl, aryl, alkylaryl, halogenoaryl, aralkyl, alkoxyalkyl, halogenoalkyl, hydroxyalkyl, carboxyalkyl or carboalkoxyalkyl, or two alkyl radicals or alkylene radicals of the meaning of R_9 together with the nitrogen atom can also form a morpholine, piperidine or piperazine ring, or B denotes a group of the formulae



in which R_{10} denotes a straight-chain or branched alkyl group having 1–18 C atoms, preferably 1–6 C atoms, which can be substituted by hydroxyl groups, halogen atoms, alkoxy radicals, aryloxy radicals or aryl radicals, or R_{10} denotes a group of the formula —$(CH_2CH_2O)_n$-R with n denoting 1, 2 or 3 and R denoting H or alkyl, or R_{10} denotes a radical of the formula

R_{11} and R_{12} denote identical or different radicals from the group comprising hydrogen, fluorine, phenyl, alkyl, alkoxy,

acylamino, cyano, carboxyl, carboalkoxy, carboxamide and alkyl sulfonates, and two adjacent radicals R_{11} and R_{12} together can also represent an alkylene group, a fused-on benzene ring or a 1,3-dioxapropylene group, and R_{13} denotes a phenyl ring which can be substituted by an alkyl group, a cyano group or a carbalkoxy group.

4,416,796

EMULSION-BREAKING COMPOSITION

Roland Böhm, Kelkheim, and Martin Hille, Liederbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

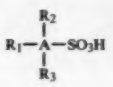
Filed Dec. 10, 1979, Ser. No. 101,473

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2854975

Int. Cl.³ B01D *17/04*

U.S. Cl. 252—338 **6 Claims**

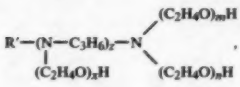
1. Surface active neutral salts of sulfonic acids of the formula I



(I)

wherein

A stands for a saturated aliphatic hydrocarbon radical or an aliphatic hydrocarbon radical having one olefinic double bond each having 3 carbon atoms, or a mononuclear or binuclear aromatic radical, especially phenyl or naphthyl, C_6H_2 or $C_{10}H_4$, R_1 stands for alkyl or alkenyl having from 1 to 21 carbon atoms, especially 1 to 18 carbon atoms and R_2 and R_3 each stand for hydrogen or alkyl having from 1 to 4 carbon atoms, and of oxethylated aliphatic amines of the formula II



(II)

wherein

R′ stands for a saturated aliphatic hydrocarbon radical or an aliphatic hydrocarbon radical having one or two olefinic double bonds each radical having from 8 to 25, preferably 10 to 2, carbon atoms, z stands for 0 or 1 and m, n and x each stand for integers of from 0 to 20, the sum of m, n and x amounting to an integer of from 5 to 40,

as demulsifiers for the demulsification of water-containing crude oil and oil sludge emulsions.

4,416,797

CHLORINATED ORGANIC COMPOUNDS HAVING THEIR RESISTANCE TO DETERIORATION ENHANCED BY 1,3-DICARBONYL COMPOUNDS

Motonobu Minagawa, Kosigaya; Tetsuyu Inoue, Warabi, and Naoyasu Kurita, Urawa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

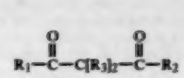
Filed Feb. 19, 1981, Ser. No. 235,817

Claims priority, application Japan, Mar. 3, 1980, 55-26256; May 19, 1980, 55-66081

Int. Cl.³ C09K *15/32*

U.S. Cl. 252—400 A **23 Claims**

1. A chlorinated organic compound having an enhanced resistance to deterioration, comprising a chlorinated organic compound selected from the group consisting of chlorinated hydrocarbons having from one to about fifty carbon atoms and chlorinated higher fatty acid esters having from ten to about thirty carbon atoms and an effective amount of a 1,3-dicarbonyl compound having the formula:



wherein:

R_1 is selected from the group consisting of hydrogen, hydrocarbon groups having from one to about eighteen carbon atoms and such groups substituted with one or more groups selected from the group consisting of halogen, hydroxy, alkoxy OR_1, ester $COOR_1$, alkyl and alkoxycarbonyl alkyl having from one to about eighteen carbon atoms;

R_2 is selected from the group consisting of hydrocarbon groups having from one to about eighteen carbon atoms and such groups substituted with one or more groups selected from the group sisting of halogen, hydroxy, alkoxy OR_1, ester $COOR_1$, alkyl and alkoxycarbonyl alkyl having from one to about eighteen carbon atoms; and

R_3 is selected from the group consisting of hydrogen, hydrocarbon groups having from one to about eighteen carbon atoms and such groups substituted with one or more groups selected from the group consisting of halogen, hydroxy, alkoxy OR_1, ester $COOR_1$, alkyl and alkoxy carbonyl alkyl having from one to about eighteen carbon atoms; and

provided, when both R_3 are hydrogen, at least one of R_1 and R_2 is other then methyl.

4,416,798

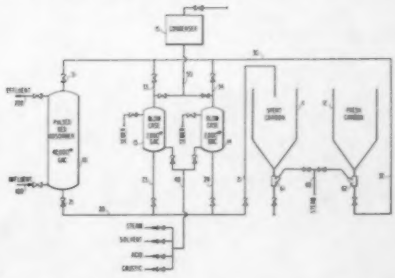
PULSED REGENERATION OF ADSORPTION COLUMN

Donald G. Hager, Tucson, Ariz.; Michael L. Massey, Covington, Va., and Frederick Rubel, Jr., Tucson, Ariz., assignors to Westvaco Corporation, New York, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,566

Int. Cl.³ B01J *20/34;* **B01D** *15/00*

U.S. Cl. 502—420 **2 Claims**



1. A method of regenerating adsorptive material used in an adsorptive fluid treatment column comprising the steps of:

A. delivering influent to one face of a vertical column of adsorptive material;

B. withdrawing effluent from another face of said vertical column;

C. periodically withdrawing from the one face of said column a fractional portion of spent adsorptive material and depositing same in a first ancillary pressure vessel;

D. replenishing said column at the other face with a similar fractional portion of steam regenerated adsorptive material drawn from a second ancillary pressure vessel; and,

E. regenerating said first vessel spent material with steam over the period between successive withdrawals of said

material whereby the spent material portion in said first vessel withdrawn during a first transfer interim becomes the regenerated material portion supplied by said second vessel during a second, successive transfer interim.

2. A method as described by claim 1 wherein said spent material regeneration is a steam sterilization process.

4,416,799

CATALYTIC COMPONENT FOR POLYMERIZING α-OLEFIN AND METHOD FOR HOMO- OR CO-POLYMERIZATION OF α-OLEFIN

Masaru Takitani; Keikichi Baba, and Shizuo Tomiyasu, all of Shinnanyo, Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 214,715, Dec. 9, 1980, abandoned. This application Nov. 1, 1982, Ser. No. 438,400

Claims priority, application Japan, Dec. 18, 1979, 54-165336

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—156 **19 Claims**

1. A catalytic component for polymerization of an α-olefin, said catalytic component being prepared by the following steps:

(1) reacting an organic acid ester with an organo-magnesium compound expressed by a general formula RMgR′, wherein R and R′ represent the same or different hydrocarbon radicals having 1–10 carbon atoms;

(2) reacting the product of step (1) with carbon tetrahalide;

(3) treating the resultant product from step (2) with a phenol compound; and

(4) treating the product from step (3) with a titanium compound containing halogen.

4,416,800

METHOD FOR PRODUCING A CATALYST AND A CARRIER THEREFOR INCLUDING HEAT-RESISTANT FIBERS

Kazunobu Abe, Izumi, and Tadao Nakatsuji, Matsubara, both of Japan, assignors to Sakai Chemical Industry Co., Ltd., Japan

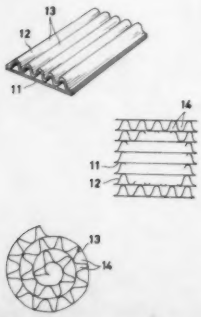
Division of Ser. No. 72,599, Sep. 5, 1979, Pat. No. 4,280,926. This application Mar. 19, 1981, Ser. No. 245,687

Claims priority, application Japan, Sep. 12, 1978, 53-112558; Jan. 9, 1979, 54-1694; Apr. 27, 1979, 54-53186

The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.

Int. Cl.³ B01J *35/04, 31/28, 21/14, 21/12*

U.S. Cl. 502—159 **19 Claims**



1. A method for producing a catalytic material, which consists essentially of admixing

(a) a slurry prepared by beating at least one of inorganic fibers of about 1–20 mm in fiber length and of about 0.1–30 microns in diameter selected from the group consisting of asbestos fiber, silica fiber, silica-alumina fiber, chrysotile fiber, rock wool, glass fiber, anthophyllite fiber, potassium titanate fiber, carbon fiber and ceramic fiber, in water, and

(b) at least one powdery water-insoluble carrier material selected from the group consisting of titanium oxide and aluminum oxide or a powdery water-insoluble precursor of the carrier material which will be converted into the oxide when calcined,

thereby forming a stock material containing the solid components of fiber and carrier material in an amount of 1–10% by weight with about 80–40 parts by weight of fiber in relation to 20–60 parts by weight of carrier material, forming the stock material into a sheet by paper-making means and drying the sheet,

and then immersing the sheet or a honeycomb structure manufactured therefrom in an impregnating slurry or solution containing catalytically active agents or their precursors which will be converted into the active agent when calcined, and optionally carrier materials or their precursors which will be converted into the oxide when calcined, and drying the sheet or honeycomb structure.

3. The method as claimed in claim 1, wherein the honeycomb structure is manufactured from the sheet with an adhesive which comprises 100 parts by weight of an aqueous colloidal silica solution containing about 10–30% by weight of silica of about 1–100 millimicrons in particle size and about 10–45 millimicrons in average particle size, and 1–50 parts by weight of at least one of finely divided refractory oxide particles selected from the group consisting of silica having specific surface area of 100–400 m^2/g, primary particle size of 25–150 millimicrons and average particle size of 40–200 millimicrons, alumina having specific surface area of 100–300 m^2/g, primary particle size of 10–150 millimicrons and average particle size of 30–70 millimicrons, silica-alumina having specific surface area of about 200 m^2/g, primary particle size of 1–80 millimicrons and average particle size of 10–30 millimicrons, and titania having specific surface area of about 50 m^2/g, primary particle size of 10–120 millimicrons and average particle size of 15–40 millimicrons, uniformly dispersed in the colloidal solution.

5. The method as claimed in claim 1, wherein the impregnating slurry or solution further contains 1–10 parts by weight of at least one inorganic heat-resistant fiber of about 0.1–30 microns in diameter and about 0.5–5 mm in fiber length selected from the group consisting of asbestos fiber, ceramic fiber, silica fiber, silica-alumina fiber, chrysotile fiber, rock wool, glass fiber, potassium titanate fiber, anthophyllite fiber and carbon fiber, or about 0.5–5 parts by weight of polytetrafluoroethylene fiber, in relation to 100 parts by weight of the total weight of catalytically active agents, carrier materials and their precursors.

17. A method for producing a catalytic material, which consists essentially of admixing

(a) a slurry prepared by beating at least one of inorganic fibers of about 1–20 mm in fiber length and of about 0.1–30 microns in diameter selected from the group consisting of asbestos fiber, silica fiber, silica-alumina fiber, chrysotile fiber, rock wool, glass fiber, anthophyllite fiber, potassium titanate fiber, carbon fiber and ceramic fiber, in water, and

(b) at least one powdery water-insoluble carrier material selected from the group consisting of titanium oxide and aluminum oxide or a powdery water-insoluble precursor of the carrier material which will be converted into the oxide when calcined,

thereby forming a stock material containing the solid components of fiber and carrier material in an amount of 1–10% by weight with about 80–40 parts by weight of fiber in relation to 20–60 parts by weight of carrier material, forming the stock material into a sheet by paper-making means and drying the sheet, and then

immersing the sheet or a honeycomb structure manufactured therefrom in an impregnating slurry or solution containing carrier materials and catalytically active agents or their precursors which will be converted into their oxides when calcined and drying the sheet or honeycomb structure.

4,416,801

TOLUIC ACID

Francis J. Waller, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 215,712, Dec. 15, 1980, Pat. No. 4,356,318, which is a continuation-in-part of Ser. No. 174,920, Aug. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 108,819, Dec. 31, 1979, abandoned. This application Aug. 19, 1982, Ser. No. 409,716

Int. Cl.³ B01J *31/06*

U.S. Cl. 502—153 3 Claims

1. Perfluorinated polymeric sulfonic acid having, based on the sulfonic acid groups, about 5 to 98.5 mol % of hydrogen ions and 1.5 to about 95 mol % of rhodium, iridium, ruthenium, platinum, palladium or osmium ions.

4,416,802

CATALYSTS FOR THE PRODUCTION OF MALEIC ANHYDRIDE BY THE OXIDATION OF BUTANE

Carl A. Udovich, Joliet, and Robert C. Edwards, Naperville, both of Ill., assignors to Standard Oil Co. (Indiana), Chicago, Ill.

Filed May 26, 1982, Ser. No. 382,180

Int. Cl.³ B01J *27/14*

U.S. Cl. 502—209 8 Claims

1. A process for the manufacture of a phosphorus/vanadium/metal oxide catalyst suitable for use in the manufacture of maleic anhydride which process comprises reacting in an aqueous medium, a vanadium compound and inorganic acid and metal oxide, then adding orthophosphoric acid to form a soluble vanadium phosphorus metal oxide catalyst removing the acidified water and adding an aliphatic alcohol having 1 to 8 carbon atoms, removing the alcohol and drying the catalyst syrup under vacuum of about 0 to 300 mm Hg at a temperature of 90° to 120° C. to produce the solid catalyst.

4,416,803

PROCESS FOR THE MANUFACTURE OF CATALYSTS USEFUL FOR THE OXIDATION OF BUTANE TO MALELIC ANHYDRIDE

Carl A. Udovich, Joliet; Eugene H. Hirschberg, Park Forest, and Ralph J. Bertolacini, Lisle Township, DuPage County, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 26, 1982, Ser. No. 382,181

Int. Cl.³ B01J *27/14*

U.S. Cl. 502—209 6 Claims

1. A process for the manufacture of a phosphorus/vanadium/metal oxide catalyst wherein the metal has a valence of at least II which is suitable for use in the manufacture of maleic anhydride, which process comprises reacting orthophosphoric acid in an aliphatic alcohol having 1 to 8 carbon atoms and reacting vanadium compound with an acid and the metal in the aliphatic alcohol to produce a phosphorus/vanadium/metal oxide catalyst which is soluble in the media wherein the dissolved phosphorus/vanadium/metal oxide catalyst is solidified by the evaporation of the acidified alcohol and a brown amorphous catalyst precursor is separated from the product and a deep blue phosphorus vanadium oxide catalyst is recovered.

4,416,804

ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, and Tai-Hsiang Chao, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 324,302, Nov. 23, 1981, Pat. No. 4,367,137, which is a continuation of Ser. No. 212,780, Dec. 4, 1980, abandoned. This application Jun. 7, 1982, Ser. No. 385,589

Int. Cl.³ B01J *27/14*

U.S. Cl. 502—213 17 Claims

1. An acidic catalytic composite comprising a porous carrier material containing at least five catalytic components comprising, on an elemental basis, from about 0.01 to about 2 wt% platinum, from about 0.5 to about 5 wt% cobalt, from about 0.01 to about 5 wt% tin, from about 0.01 to about 5 wt% phosphorous and from about 0.1 to about 3.5 wt% of a halogen component.

4,416,805

SYNTHESIS OF ZEOLITES OF SMALL AND UNIFORM SIZE HAVING A HIGH MAGNESIUM EXCHANGE CAPACITY

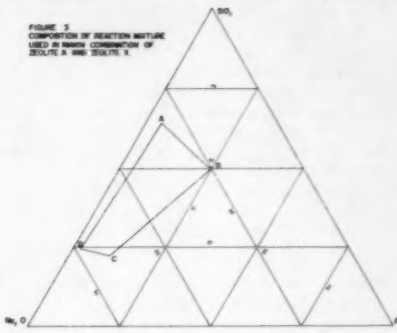
John A. Kostinko, Bel Air, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 88,243, Oct. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 971,584, Dec. 20, 1978, Pat. No. 4,235,856. This application Nov. 4, 1980, Ser. No. 203,927

The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.

Int. Cl.³ C01B *33/28;* B01J *29/06*

U.S. Cl. 502—67 6 Claims



1. A method of producing a combination of zeolite A and zeolite X comprising the steps of:

(a) dissolving sand in a sodium hydroxide solution at a pressure of at least 100 psig heated to a temperature of at least 130 degrees Celsius to produce a sodium silicate solution having a silica to sodium oxide molar ratio of between 2.4:1 and 2.8:1 to form a sodium silicate solution;

(b) activating said sodium silicate solution by treating with from 50 to 2000 ppm alumina;

(c) forming a sodium aluminate solution;

(d) heating said sodium silicate and sodium aluminate solution to between 40 and 120 degrees Celsius;

(e) adding together said sodium aluminate solution and said sodium silicate solution to produce a reaction mixture comprising a sodium silicate mother liquor and an amorphous sodium alumina silicate, in total having a water to sodium oxide molar ratio of between 10:1 and 60:1; a sodium oxide to silica molar ratio of between 0.5:1 and 3:1; and a silica to alumina molar ratio of between 2:1 and 15:1;

(f) heating said mixture;

(g) reacting said mixture until a combination of zeolite A and zeolite X is formed; and

(h) recovering said combination of zeolite A and zeolite X.

4,416,806

CATALYST FOR PRODUCTION OF AROMATIC HYDROCARBONS AND PROCESS FOR PREPARATION

Jean-Rene Bernard, Serezin du Rhone, and Michele Breysse, Villeurbanne, both of France, assignors to Elf France, Paris, France

Continuation of Ser. No. 272,176, Jun. 10, 1981, abandoned. This application Mar. 4, 1983, Ser. No. 471,902

Int. Cl.³ B01J *29/12*

U.S. Cl. 502—74 32 Claims

1. A process for preparing a bimetallic catalyst for the dehy-

drocyclization of paraffins comprising a carrier comprised of a zeolitic crystalline aluminosilicate exchanged with more than 90% of alkali metal cations and having a pore diamter larger than 6.5 Angstroms; 0.1 to 1.5% platinum; 0.1 to 1.5% rhenium obtained from rhenium carbonyl, the ratio of the rhenium/platinum varying with the pressure of use; a small amount of sulphur such that the ratio x of the number of sulphur atoms to platinum and rhenium atoms is from betweeon about 0.05 and 0.6, said process comprising the impregnating steps carried out in any desired order

(a) charging the carrier with rhenium by sublimation of rhenium carbonyl;

(b) impregnating the carrier with an aqueous solution or water soluble complex of platinum;

(c) incorporating sulphur into the carrier by contacting with a sulphur containing compound;

(d) the impregnated carrier having received the charges of rhenium carbonyl, platinum complex, and sulphur compound being then dried, optionally calcined, and reduced by hydrogen at a temperature from about 300° C. to 500° C. prior to use.

13. A process for making a bimetallic catalyst for the dehydrocyclization of paraffins, comprising a carrier comprised of a zeolitic crystalline aluminosilicate exchanged with more than 90% of alkali metal cations and having a pore diameter larger than 6.5 Angstroms; 0.1 to 1.5% platinum; 0.1 to 1.5% rhenium obtained from rhenium carbonyl, the ratio of the rhenium/platinum varying with the pressure of use; a small amount of sulphur such that the ratio x of the number of sulphur atoms to platinum and rhenium atoms is from between about 0.05 and 0.6, said process comprising the impregnating steps carried out in any order desired:

(a) charging the carrier with rhenium by impregnation with a solution of rhenium carbonyl in acetone;

(b) impregnating the carrier with an aqueous solution or water soluble complex of platinum;

(c) impregnating sulphur by impregnation of the carrier with a solution of a sulphur containing compound; and

(d) after the impregnation steps, drying, heat treating and reducing the impregnated carrier with hydrogen at a temperature between about 300° C. and 550° C. prior to use.

14. A bimetallic catalyst prepared by the method of claim **1** or **13**.

4,416,807

CONDUCTIVE VIDEO DISCS

Pabitra Datta, Cranbury, and Ronald N. Friel, Hamilton Square, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 14, 1981, Ser. No. 311,257

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—511 **14 Claims**

1. A conductive molding composition comprising:

(a) sufficient conductive carbon black particles so that the composition has a bulk resistivity below 500 ohm-cm at 900 megahertz;

(b) from about 0.25 to about 2.5 percent by weight of a suitable lubricant;

(c) from about 2 to about 10 percent by weight of a suitable flow modifier; and

(d) a thermosplastic material selected from the group consisting of: a homopolymer of styrene, an acrylic acid ester, or a methacrylic acid ester; a copolymer of styrene and acrylonitrile, an acrylic acid ester or a methacrylic acid ester; and mixtures thereof.

4,416,808

BIS-BETAINE-AMINE OXIDES, PROCESS FOR THEIR PREPARATION, AND CLEANING AGENTS CONTAINING THEM

Günter Blaschke, Winböring; Alwin Reng, Kelkheim, and Jochen M. Quack, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

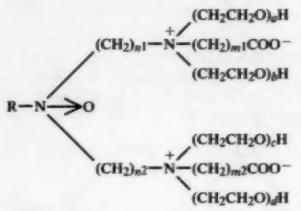
Filed Nov. 8, 1982, Ser. No. 439,732

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145734

Int. Cl.³ C07C *79/16;* **C11D** *1/75, 1/90, 7/32*

U.S. Cl. 252—547 **4 Claims**

1. Bis-betaine-amine oxides of the formula



(I)

in which

R is a saturated or an olefinically unsaturated hydrocarbon radical having 1 to 3 double bonds and 8 to 22 carbon atoms,

n^1 and n^2 each is an integer of from 2 to 3, n^1 and n^2 optionally being identical or different,

m^1 and m^2 each is an integer of from 1 to 4, m^1 and m^2 optionally being identical or different, and

a, b, c and d, being identical or different, each is a number of from 1 to 5, with the proviso that the sum (a+b+c+d) is at most 10.

4,416,809

GRANULAR DETERGENT COMPOSITION

Teruo Magari, Funabashi; Mitsuyoshi Yazaki, and Masayoshi Nakamura, both of Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Apr. 30, 1982, Ser. No. 373,714

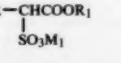
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1981, 66590

Int. Cl.³ C11D *1/12*

U.S. Cl. 252—557 **11 Claims**

1. A granular detergent composition comprising:

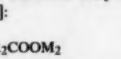
(a) at least one α-sulfo fatty acid ester salt having the general formula [I]:



[I]

wherein R is a alkyl group having 4 through 20 carbon atoms, R_1 is an alkyl group having 1 through 6 carbon atoms, and M_1 is a salt-forming pair ion;

(b) at least one fatty acid soap having the general formula [II]:



[II]

wherein R_2 is an alkyl group having 8 through 20 carbon atoms, and M_2 is an alkali metal; and

(c) at least one polycarboxylic acid salt having 2 to 8 carbon atoms, the total content of the components (a) and (b) in the composition being 20% through 80% by weight, the weight ratio of the component (a) to the component (b) being within the range of from 4/1 through 1/4, and the

content of the component (c) in the composition being 1% through 20% by weight.

4,416,810

DISPOSAL OF RADIOACTIVE AROMATIC LIQUID WASTES

John E. Noakes, 4295 Barnett Shoals Rd., Athens, Ga. 30605

Filed Jul. 30, 1981, Ser. No. 288,534

Int. Cl.³ G21F 9/16

U.S. Cl. 252—628 5 Claims

1. A process for solidifying radioactive wastes comprising an aromatic liquid and an organic fluor, comprising the steps of:

(1) making a dispersion of the waste and water, in which at least half of the dispersion by volume is water, at least 3% of the dispersion by volume is a surfactant, and the continuous phase is water

(2) mixing the thus-formed dispersion with Portland cement so that for every 100 parts by weight of cement, there is between 30 and 40 parts by weight of water, said water being from the dispersion

(3) casting the thus-formed mixture into suitable containers and allowing it to set up

(4) transporting the set-up cement-like mixture to a suitable disposal site and

(5) leaving the set-up cement-like mixture at the disposal site for permanent disposal.

4,416,811

DETERGENT SOFTENER COMPOSITIONS

Harold E. Wixon, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 96,370, Nov. 21, 1979, Pat. No. 4,298,480, which is a continuation-in-part of Ser. No. 968,532, Dec. 11, 1978, Pat. No. 4,230,590. This application Jul. 31, 1981, Ser. No. 288,921

The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.

Int. Cl.³ C11D 1/86, 10/04, 17/06; D06M 13/48

U.S. Cl. 252—8.75 23 Claims

1. A detergent softener composition capable of imparting improved softness, detergency antistatic and soil antiredeposition properties to fabrics treated therewith in the wash cycle of a laundering process comprising,

(a) spray-dried detergent particles comprising in percents relative to the weight of the composition, from about 5 to 40% of water soluble nonsoap organic surfactant at least about 90% thereof being an anionic surfactant, from about 1.6 to 7% soap dispersed throughout the particles, and from about 10 to 60% of water soluble neutral to alkaline builder salt;

(b) about 2 to 20% by weight relative to the weight of the composition, of discrete particles of soap; and

(c) about 2 to 20% by weight relative to the weight of the composition, of discrete particles of cationic amine softener,

wherein said discrete soap particles do not contain cationic softener and said cationic softener particles do not contain soap, wherein said discrete particles are in admixture with said spray-dried detergent particles and said spray-dried detergent particles do not include cationic amine softener, and wherein said soap is a water soluble or dispersible fatty acid soap, and said cationic softener is a cationic amine softener selected from the group consisting of (1) aliphatic di-(lower)C_1–C_4 alkyl, di(higher)C_{14}–C_{24} alkyl quaternary ammonium salts (2) heterocyclic imide compounds, and mixtures of (1) and (2), the weight ratio of soap to softener being from about 8:1 to 1:3 and the percent concentration of anionic surfactant being at least about 1.5x+5, wherein x represents the percent concentration of softener.

21. A detergent softener composition according to claim 1 comprising in weight percentages relative to the total weight of the composition from about 3 to about 5% of the cationic softener selected from the group consisting of distearyl dimethyl ammonium chloride, di-hydrogenated tallow dimethyl ammonium chloride, di-tallow dimethyl ammonium chloride, distearyl dimethyl ammonium methyl sulfate, di-hydrogenated tallow dimethyl ammonium methyl sulfate, methyl-1-tallow amido ethyl-2-tallow imidazolinium methyl sulfate, and methyl-1-oleyl amido ethyl-2-oleyl imidazolinium methyl sulfate; the soap selected from the group consisting of an alkali metal salt of a C_{10} to C_{30} fatty acid at least about 50% thereof being C_{10} to C_{18} fatty acid; the spray-dried detergent particles comprising from about 10 to 60% of detergent builder particles selected from the group consisting of alkali metal phosphate, sodium carbonate, metakaolin and zeolite detergent builders, about 3 to 4.6% soap dispersed throughout the particles, and from about 15 to 23% of the nonsoap anionic surfactant.

4,416,812

METHOD OF PREPARING TISSUE THROMBOPLASTIN

Udo Becker, Munich; Eugen Schaich, Weilheim, and Manfred Weigert, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Dec. 1, 1982, Ser. No. 446,088

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3150596

Int. Cl.³ C07G 7/00, 7/026

U.S. Cl. 260—112 R 10 Claims

1. A method of producing a tissue thromboplastin preparation which is sensitive to coagulation factor VII comprising extracting an acetone dry powder from mammalian tissue with an aqueous salt solution of 1 to 20 mmol/l of calcium ions.

4,416,813

ARTIFICIAL CARRIER FOR IMMOBILIZATION OF BIOLOGICAL PROTEINS

Mikio Ikeda, Tachikawa, and Takayuki Tomizawa, Tokyo, both of Japan, assignors to Fujizoki Pharmaceutical Co. Ltd., Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,249

Claims priority, application Japan, Mar. 18, 1981, 56-37855; Mar. 31, 1981, 56-46211

Int. Cl.³ C09H 7/00; C12N 11/02, 11/10; G01N 33/54

U.S. Cl. 260—117 23 Claims

1. A process for producing an artificial carrier for immobilization of biological proteins which comprises: forming a solution of gelatin, a water soluble polysaccharide and sodium metaphosphate having the formula $(NaPO_3)_n$, wherein n is a whole number from 3 to 6 at a temperature above the gelation temperature of said gelatin; mixing with agitation an acid with said solution to adjust the pH of said solution to between about 2.5 and 6 whereby particles are formed and treating said particles with an aldehyde to thereby insolubilize said particles.

4,416,814

PROTEIN POLYMER HYDROGELS

Orlando A. Battista, 3725 Fox Hollow Rd., Fort Worth, Tex. 76109

Continuation-in-part of Ser. No. 246,660, Mar. 23, 1981, Pat. No. 4,349,470, which is a continuation-in-part of Ser. No. 74,014, Sep. 14, 1979, Pat. No. 4,264,493, which is a continuation-in-part of Ser. No. 952,303, Oct. 18, 1978, abandoned. This application Sep. 10, 1982, Ser. No. 416,475

The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.

Int. Cl.³ C07G 7/00; C08H 1/00, 1/06, 9/00

U.S. Cl. 260—117 20 Claims

1. The method of preparing a three-dimensional structure comprising preparing an aqueous acidic solution of a non-crystalline, natural animal or vegetable protein polymer or mixtures thereof, the polymers having an average molecular weight not exceeding 100,000, shaping the solution into a three-dimensional structure, subjecting the structure to a vapor

phase crosslinking reaction using at least two crosslinking agents in vaporized state to form a crosslinked polymer structure, subjecting the structure to washing with water, subjecting the washed structure to dehydration by immersion in water-miscible organic solvent mixture, subjecting the structure to washing with water and drying the structure to a moisture content of not more than 10 percent.

4,416,815

FIBER-REACTIVE UNSYMMETRICAL 1:2 CHROMIUM COMPLEX AZO DYES

Hans U. Schütz, Basel, and Arthur Bühler, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

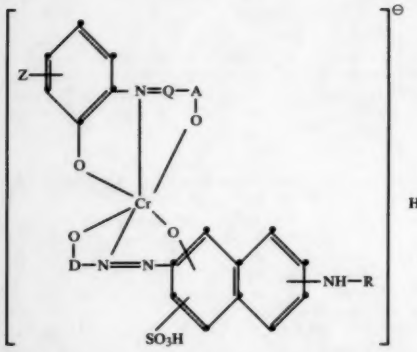
Filed Oct. 14, 1980, Ser. No. 196,423

Claims priority, application Switzerland, Oct. 19, 1979, 9416/79

Int. Cl.³ C09B *45/48, 62/08, 62/24, 62/50*

U.S. Cl. 260—145 A **8 Claims**

1. A chromium complex dye which, in the form of the free acid, has the formula



wherein Z is hydrogen, nitro, chlorine, or a phenylazo group, Q is a nitrogen atom, A is the radical of a 1-aryl-3-methyl-pyrazol-5-one, of an acetoacetarylide, of a naphthol or of a phenol which couples in the ortho-position to the hydroxyl group and is substituted by acylamino, lower molecular alkyl or low molecular dialkylamino, D is a sulfophenyl radical which can be substituted by nitro or chlorine, or a sulfonaphthyl radical which can be substituted by nitro and is bonded to the azo group in the ortho-position to the oxygen atom, and R is chloroacetyl, bromoacetyl, α-chloro- or α-bromoacryloyl, or α,β-dichloro- or α,β-dibromopropionyl.

4,416,816

1:2 CHROMIUM COMPLEX OF 1-AMINO-2-(3',5'-DINITRO-2'-HYDROXYPHENYLAZO)-4-SULFONAPHTHALENE AND ALKALI METAL SALTS THEREOF

Hans Grossmann, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

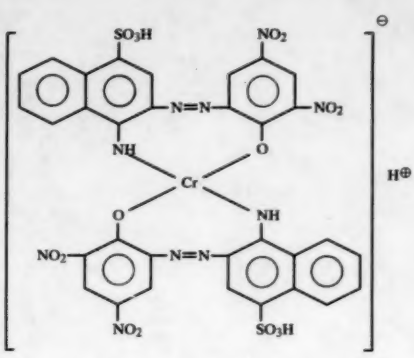
Continuation-in-part of Ser. No. 373,630, Jun. 26, 1973, abandoned. This application Nov. 29, 1978, Ser. No. 964,698

Claims priority, application Switzerland, Jun. 28, 1972, 9676/72

Int. Cl.³ C09B *45/14;* **C23F** *5/04;* **D06P** *1/10, 3/24*

U.S. Cl. 260—151 **6 Claims**

1. The 1:2 chromium complex of the formula



or an alkali metal salt thereof.

4,416,817

3-METHOXY-2-OXOAZETIDINE DERIVATIVES AND THEIR PRODUCTION

Taisuke Matsuo, Ibaraki, and Michihiko Ochiai, Osaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 152,808, May 23, 1980, abandoned. This application Nov. 18, 1981, Ser. No. 322,661

Claims priority, application Japan, Jun. 8, 1979, 54-72812; Mar. 22, 1980, 55-36365

Int. Cl.³ C07D *205/08, 403/14, 403/12, 403/06*

U.S. Cl. 260—239 A **12 Claims**

1. A compound of the formula:

wherein R_1 is

(1) amino;

(2) amino mono-substituted by an acyl group selected from the group consisting of

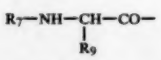
(A) a group of the formula:

wherein R_6 is

(i) C_{1-6} alkyl or

(ii) a heterocyclic group selected from the group consisting of isoxazolyl, piperazinyl and imidazolinyl, said heterocyclic group being unsubstituted or mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, nitro, amino, oxo, thioxo, phenyl or phenyl mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, nitro or amino;

(B) a group of the formula:



wherein R_7 is

(i) hydrogen,

(ii) an amino acid residue selected from the group consisting of glycyl, alanyl, valyl, leucyl, isoleucyl, seryl, threonyl, cysteinyl, cystyl, methionyl, α- or β-aspartyl, α- or γ-glutamyl, lysyl, arginyl, phenylalanyl, phenylg-

lycyl, tyrosyl, histidyl, tryptophyl or prolyl, the said amino acid residue being unsubstituted or mono- to tri-substituted by amino, lower alkyl amino, amino-protecting group carbamoyl, methylcarbamoyl, sulfamoyl, benzyl, 4-ethyl-2,3-dioxo-1-piperazinocarbonyl or 4-ethyl-2,3-dioxo-1-piperazinocarbonylamino,

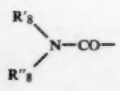
(iii) an amino-protecting group selected from the group consisting of phthaloyl, p-nitrobenzoyl, p-tert-butylbenzoyl, p-tert-butyl-benzenesulfonyl, benzenesulfonyl, toluenesulfonyl, formyl, acetyl, propionyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, methanesulfonyl ethanesulfonyl, trifluoroacetyl, maloyl, succinyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl, β,β,β-trichloroethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, diphenymethyloxycarbonyl, methoxymethyloxycarbonyl, acetylmethyloxycarbonyl, isobornyloxycarbonyl, phenyloxycarbonyl, (hexahydro-1H-azepin-1-yl)methylene, 2-amino-2-carboxyethylsulfonyl, trityl, 2-nitrophenylthio, benzylidene, 4-nitrobenzylidene, di- or trialkylsilyl, benzyl and p-nitrobenzyl,

(iv) a group of the formula R_8—$(CH_2)_n$—CO— in which R_8 is

(a) a heterocyclic group selected from the group consisting of 2-pyridyl, 3-pyridyl, 4-pyridyl, pyrimidinyl, pyrazinyl, pyridazinyl, piperazinyl, pyrazolinyl, imidazolidinyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, pyrido[2,3-d]pyrimidinyl, benzopyranyl, 1,8-naphthyridinyl, 1,5-naphthyridinyl, 1,6-naphthyridinyl, 1,7-naphthyridinyl, 2,7-naphthyridinyl, 2,6-naphthyridinyl, quinolyl, thieno[2,3-b]pyridinyl, tetrazolyl, thiadiazolyl, oxadiazolyl, triazinyl, thienyl, pyrrolyl and furyl, said heterocyclic group being unsubstituted or mono- to tri-substituted by (1) C_{1-12} alkyl, (2) C_{1-12} alkyl substituted by phenyl, halogen, hydroxy or C_{1-3} dialkylamino, (3) C_{1-3} alkoxy, (4) hydroxy, (5) oxo, (6) thioxo, (7) formyl, (8) trifluoromethyl, (9) amino, (10) halogen, (11) n- or isopropylsulfonyl, (12) coumarin-3-carbonyl, (13) 4-formyl-1-piperazinyl, (14) pyrrolaldoimino, (15) furanaldoimino, (16) thiophenaldoimino, (17) mesyl, (18) a group selected from the group consisting of p-nitrobenzoyl, benzenesulfonyl, toluenesulfonyl, acetyl, propionyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, ethanesulfonyl, trifluoroacetyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl, β,β,β-trichloroethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, phenyloxycarbonyl, trityl, di- or trialkylsilyl, benzyl and p-nitrobenzyl, (19) C_{2-6} alkylcarbonylamino or (20) C_{2-4} alkylcarbonylamino mono- to tri-substituted by halogen, (b) phenyl which is unsubstituted or mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, hydroxy or amino, (c) phenylthio which is unsubstituted or mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, hydroxy or amino, or (d) C_{1-3} alkylthio;

n is an integer of 0 to 4; the group —$(CH_2)_n$— is unsubstituted or mono- to tri-substituted by (1) amino or (2) a group of the formula —NH—COR_8'''' wherein R_8'''' is amino, piperazinyl or piperazinyl mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, hydroxy, oxo, thioxo or halogen;

(v) a group of the formula



wherein R_8' and R_8'' are independently (a) hydrogen, (b) C_{1-3} alkyl, (c) C_{1-3} alkyl-carbamoyl, (d) sulfo, (e) phenylcarbonyl or (f) phenylcarbonyl mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, hydroxy, sulfoxy or benzyloxy; or

(vi) a group of the formula R_8''' —SO_2— wherein R_8''' is C_{1-6} alkyl or C_{1-6} alkyl mono- to di-substituted by amino, carboxyl, benzyloxycarbonyl or benzyloxycarbonylamino; R_9 is

(i) hydrogen,

(ii) C_{1-3} alkyl which is unsubstituted or mono- to tri-substituted by phenyl, carbamoyl, methylcarbamoyl, methylthio, thienylacetamide, ethoxycarbonylmethylcarbamoyl, N-methyltetrazolylthio, halogen or sulfamoyl,

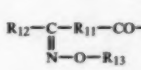
(iii) phenyl which is unsubstituted or mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, hydroxy, sulfoxy, benzyloxy, benzoyloxy, trimethylsilyl or C_{2-10} alkylcarbonyloxy,

(iv) a heterocyclic group selected from the group consisting of thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, thienyl, furyl, pyrrolyl, imidazolyl, pyrazinyl, pyrimidinyl, pyridazinyl, piperazinyl, triazinyl, tetrazolyl, thiadiazolyl and oxadiazolyl, said heterocyclic group being unsubstituted or mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, hydroxy, nitro, sulfoxy, amino, C_{2-4} alkylcarbonylamino or C_{2-4} alkylcarbonylamino mono- to tri-substituted by halogen,

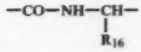
(v) cyclohexenyl selected from the group consisting of cyclohexenyl and cyclohexadienyl,

(vi) piperazinylcarbonylamino which is unsubstituted or substituted by C_{1-12} alkyl, C_{1-3} alkoxy, oxo, thioxo, or amino and which may have a C_{1-3} alkylene chain between the piperazinyl and carbonylamino moieties;

(C) a group of the formula:

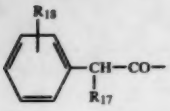


wherein R_{11} is a chemical bond or a group of the formula:



wherein R_{16} is (a) C_{1-3} alkyl, (b) phenyl, (c) phenyl mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, nitro, amino or C_{2-10} alkylcarbonyloxy, or (d) a heterocyclic group selected from the group consisting of thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, thienyl, furyl, pyrrolyl, thiadiazolyl, oxadiazolyl, triazinyl, tetrazolyl, imidazolyl, pyrazinyl, pyrimidinyl, pyridazinyl and piperazinyl, the heterocyclic group being unsubstituted or mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, hydroxy, amino or C_{2-4} alkylcarbonylamino which is unsubstituted or mono- to tri-substituted by halogen; R_{12} is (a) a heterocyclic group selected from the group consisting of 2-thiazolyl, 4-thiazolyl, 5-thiazolyl, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyrrolyl and 3-pyrrolyl, the heterocyclic group being unsubstituted or mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, hydroxy, halogen, amino or C_{2-4} alkylcarbonylamino which is unsubstituted or mono- to tri-substituted by halogen, or (b) phenyl which is unsubstituted or mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, nitro, amino, hydroxy, or by benzyloxy, benzoyloxy, C_{2-10} alkylcarbonyloxy, γ-D-glutamyloxy or 3-amino-3-carboxypropyloxy; R_{13} is (a) hydrogen, (b) C_{2-4}alkylcarbonyl which is unsubstituted or mono- to tri-substituted by halogen; (c) C_{1-3} alkyl, or (d) a group of the formula —R_{14}—R_{15} wherein R_{14} is C_{1-3} alkylene or C_{1-3} alkenylene, and R_{15} is carboxyl, methyl ester of carboxyl, ethyl ester of carboxyl, propyl ester of carboxyl or morpholino;

(D) a group of the formula:



wherein R_{17} is (a) hydroxy, (b) sulfoxy, (c) carboxyl, (d) sulfamoyl, (e) sulfamoyl mono- to tri-substituted by C_{1-3} alkyl or amidino, (f) sulfo, (g) phenoxy carbonyl, (h) phenoxy carbonyl mono- to tri-substituted by C_{1-3} alkyl or C_{1-3} alkoxy, (i) benzyloxycarbonyl or (j) formyloxy; R_{18} is (a) hydrogen, (b) C_{1-3} alkyl, (c) C_{1-3} alkoxy, (d) halogen, (e) nitro or (f) hydroxy; and

(E) a group of the formula:

$$R_{19}—R_{20}—CH_2—CO—$$

wherein R_{19} is (a) cyano, (b) phenyl, (c) phenyl mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, nitro, amino, hydroxy, aminomethyl or aminomethyl mono- to tri-substituted by carbamoyl, (2-oxo-3-benzylideneaminoimidazolidin-1-yl)carbonyl or (2-oxoimidazolidin-1-yl)carbonyl, (d) phenoxy, (e) phenoxy mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, nitro, amino, hydroxy, or aminomethyl, (f) C_{1-6} alkyl in the case where R_{20} is —S—, (g) C_{1-6} alkyl mono- to tri-substituted by halogen, hydroxy, cyano or trifluoromethyl, (h) alkenyl selected from the group consisting of vinyl and propenyl, said alkenyl being unsubstituted or mono- to tri-substituted by carboxyl or cyano; or (i) a heterocyclic group selected from the group consisting of 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-thiazolyl, 4-thiazolyl, 5-thiazolyl, isothiazolyl, 1-tetrazolyl, 5-tetrazolyl, pyrrolidinyl, imidazolyl and 1,4-oxathiinyl, said heterocyclic group being unsubstituted or mono- to tri-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, nitro, hydroxy, amino, carboxyl, oxo, C_{2-4} alkylcarbonylamino, C_{2-4} alkylcarbonylamino mono- to tri-substituted by halogen or C_{2-4} alkylcarbonyl; R_{20} is a chemical bond or —S—; or (3) amino protected by an amino-protecting group selected from the group consisting of phthaloyl, p-nitrobenzoyl, p-tert-butylbenzoyl, p-tert-butylbenzenesulfonyl, benzenesulfonyl, toluenesulfonyl, formyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, methanesulfonyl, ethanesulfonyl, trifluoroacetyl, maloyl, succinyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl, β,β,β-trichloroethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, diphenylmethyloxycarbonyl, methoxymethyloxycarbonyl, acetylmethyloxycarbonyl, isobornyloxycarbonyl, phenyloxycarbonyl, (hexahydro-1H-azepin-1-yl)methylene, 2-amino-2-carboxyethylsulfonyl, trityl, 2-nitrophenylthio, benzylidene, 4-nitrobenzylidene, di- or trialkylsilyl, benzyl and p-nitrobenzyl.

4,416,818

PREPARATION OF N-ALKOXYCARBONYL-SUBSTITUTED CYCLIC LACTAMS AND KETONES

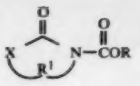
Graham S. Poindexter, Evansville, Ind., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 9, 1981, Ser. No. 309,958

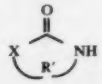
Int. Cl.³ C07D *210/00, 207/12*

U.S. Cl. 260—239.3 A **6 Claims**

1. A process for preparing N-alkoxycarbonyl-substituted cyclic lactams and nitrogen-containing cyclic ketones of the formula



where X is oxygen or methylene, R′ is C_{2-4} alkylene and R is C_{1-20} alkyl comprising reacting a C_{1-20} alkyl ester of trichloroacetic acid with a cyclic lactam or nitrogen-containing cyclic ketone of the formula



where X and R′ are as previously defined, at a temperature from about 100° C. to about 160° C. in the presence of a catalytically effective amount of an acylation catalyst.

4,416,819

PROCESS FOR PREPARING 1,5-BENZOTHIAZEPHINE DERIVATIVES

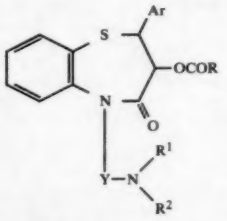
Susumu Nagao, Takasaki; Katsuhiko Kurabayashi, Annaka; Nobuyuki Futamura, Maebashi; Hidefumi Kinoshita, Takasaki, and Toshio Takahashi, Annaka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

Filed Jul. 9, 1982, Ser. No. 396,734

Int. Cl.³ C07D *281/02*

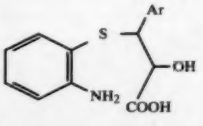
U.S. Cl. 260—293.3 B **11 Claims**

1. A process for preparing 1,5-benzothiazepine derivatives of the formula:



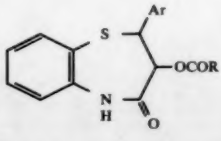
(I)

wherein Ar is a phenyl substituted with a lower alkoxy, R is a lower alkyl, R^1 and R^2 are each a lower alkyl, and Y is a lower alkylene, which comprises reacting a 2-hydroxy-3-(2′-aminophenylthio)-3-phenylpropionic acid of the formula:



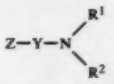
(IV)

wherein Ar is as defined above which is in the form of a salt with a base, with an acylating agent, and reacting the resulting 1,5-benzothiazepine derivative of the formula:



(II)

wherein Ar and R are as defined above, or an alkali metal salt thereof with a compound of the formula:



(III)

wherein R^1, R^2 and Y are as defined above, and Z is a halogen.

4,416,820

INDOLE DERIVATIVES AND A METHOD FOR PRODUCTION OF PEPTIDES

Tsunehiko Fukuda, Minoo; Shigeru Kobayashi, Neyagawa, and Masahiko Fujino, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

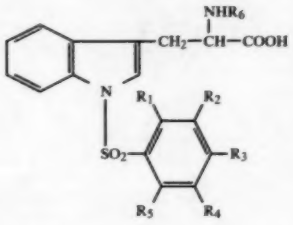
Filed Jan. 13, 1982, Ser. No. 339,054

Claims priority, application Japan, Jan. 14, 1981, 56-4506

Int. Cl.³ C07C *103/52*; C07D *209/04*

U.S. Cl. 548—496 **9 Claims**

1. A compound of the formula:



wherein R_1 and R_5 each is hydrogen, methyl or methoxy; R_2 and R_4 each is hydrogen or methyl; R_3 is methyl or methoxy; and R_6 is hydrogen or an α-amino-protecting group.

4,416,821

PROCESS FOR PREPARING 16-METHYLENE STEROIDS

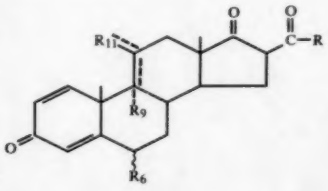
Verlan H. VanRheenen, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 17, 1982, Ser. No. 349,490

Int. Cl.³ C07J *7/00*

U.S. Cl. 260—397.1 **28 Claims**

1. A 16-substituted steroide of the formula



(IIB)

where

R is a hydrogen atom, trifluoromethyl or cyano group or $COOR_{16}$,

R_6 is a hydrogen or fluorine atom or methyl group,

R_9 is nothing or a hydrogen or fluorine atom, which includes the $\Delta^{9(11)}$ and $9\beta,11\beta$-epoxide functionality,

R_{11} is nothing or a hydrogen or oxygen atom, an α-hydroxy group, or a β-hydroxy group, which includes the $\Delta^{9(11)}$ and $9\beta,11\beta$-epoxide functionality,

~ is a single or double bond, and

~ indicates that the attached group can be in either the α or β configuration.

4,416,822

17β-DIFLUOROMETHYL STEROIDS

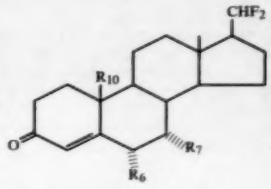
J. Allan Campbell, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 9, 1982, Ser. No. 396,968

Int. Cl.³ C07J *1/00*

U.S. Cl. 260—397.4 **12 Claims**

1. A 17β-difluoromethyl steroid of the formula



(IV)

where R_6 is a hydrogen atom or methyl group with a proviso that R_6 is a hydrogen atom when R_7 is a methyl group; where R_7 is a hydrogen atom or methyl group with a proviso that R_7 is a hydrogen atom when R_6 is a methyl group; and R_{10} is a hydrogen atom or methyl group.

4,416,823

DIMERIC CARBONYLATION OF 1,3-ALKADIENE

Paul Foley, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,818

Int. Cl.³ C11C *3/02*

U.S. Cl. 260—410.9 R **33 Claims**

1. A process for dimeric hydroesterification of 1,3-alkadiene which comprises (1) reacting 1,3-alkadiene with carbon monoxide and alkanol in a liquid medium containing a stabilized halide-free catalyst complex of palladium, tertiary phosphine ligand and thiol compound; and (2) recovering dimeric alkyl alkadienoate product.

4,416,824

RECOVERY OF TRIARYLBORANES BY FORMING BORON-CONTAINING METAL COMPOUNDS

Ronald A. Reimer, and Gerald T. Stowe, both of Orange, Tex., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 21, 1981, Ser. No. 333,176

Int. Cl.³ C07F *15/00*, *15/04*

U.S. Cl. 260—439 R **11 Claims**

1. A process for recovering a triarylborane in solution in organic nitriles which comprises reacting said borane with a cyanide ion and a metal salt wherein said metal is selected from the group consisting of groups IIA, IB, IIB, VIIB and VIII in the presence of said nitrile, and thereafter separating the boron containing reaction product from said nitrile.

7. In a process for the production of dinitriles by the addition of hydrogen cyanide to non-conjugated, unsaturated nitriles in the presence of a zero-valent nickel-organophosphorus ligand containing catalyst promoted with an arylborane wherein the product fluid from said addition is contacted with a paraffin or cycloparaffin to form a primary light hydrocarbon extract phase and a heavy dinitrile phase containing soluble catalyst and promoter which phases are separated the improvement comprising recovering the arylborane by reacting said dinitrile phase with a cyanide ion and a metal salt wherein said metal is selected from the group consisting of groups IIA, IB, IIB, VIIB and VIII, separating the boron containing reaction product from said dinitrile phase.

4,416,825
PREPARATION OF ZEROVALENT NICKEL COMPLEXES

John J. Ostermaier, Orange, Tex., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Feb. 23, 1982, Ser. No. 351,421
Int. Cl.³ C07F 15/04
U.S. Cl. 260—439 R **6 Claims**

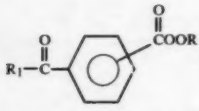
1. An improved process for the continuous production of a zerovalent nickel complex having the general formula $Ni(L)_4$ where L is a neutral ligand of the formula $P(Z)_3$ where Z is R or OR and R is an alkyl or an aryl group of up to 18 carbon atoms which comprises continuously contacting elemental nickel having a surface area of at least about 800 square centimeters per gram of nickel, in a reaction medium comprising in percent by weight based upon the weight of the liquid in the reaction medium at least 50% L, at least 2% of an organic nitrile having 4–20 carbon atoms and at least 100 ppm Cl as an organochloridite while maintaining the temperature in °C. of the reaction within the range defined by a minimum temperature equal to $102-0.375\times(\%L)$ and a maximum temperature equal to $58.3+0.725\times(\%L)$.

4,416,826
PERESTERS AND USE THEREOF

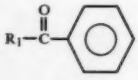
Douglas C. Neckers, Perrysburg, Ohio

Filed Oct. 29, 1980, Ser. No. 202,040
Int. Cl.³ C07D 265/30, 211/60, 307/20; C07C 179/18
U.S. Cl. 260—453 RZ **10 Claims**

1. Compound of the formula:



wherein R is a C_1–C_{22} alkyl group; and R_1 is an organic group such that the moiety



is a light absorbing chromophore group which produces an excited state by light absorption and is selected from the group consisting of C_1–C_{22} alkyl groups, C_3–C_{22} cycloalkyl groups, C_6–C_{22} aryl groups, C_7–C_{22} aralkyl groups, C_7–C_{22} alkaryl groups, C_1–C_{22} alkoxy substituted aryl groups and morpholinyl, piperidyl, thiophenyl and furanyl heterocyclic groups.

4,416,827
PROCESS FOR THE RESOLUTION OF THE RACEMATE (1RS,2SR)-2-AMINO-1-PHENYL-PROPAN-1-OL

Horst Bethge; Axel Kleemann, both of Hanau, and Jürgen Martens, Alzenau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,325
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134129
Int. Cl.³ C07C 99/12, 85/26
U.S. Cl. 260—501.12 **13 Claims**

1. A process of resolving the racemate (1RS,2SR)-2-amino-1-phenyl-propan-1-ol comprising dissolving the racemate together with an optical isomer of S-(carboxymethyl)-cysteine in a solvent in which the salt of said optical isomer with one of the isomers present in said racement is less soluble than the salt of said optical isomer with the other one of the isomers present in said racemate and precipitating the less soluble salt.

9. A compound which is either (1) a salt of S-(carboxymethyl)-(R)-cysteine and (1R,2S)-2-amino-1-phenyl-propan-1-ol or (2) a salt of S-(carboxymethyl)-(S)-cysteine and (1S,2R)-2-amino-1-phenyl-propan-1-ol.

4,416,828
PROCESS FOR THE RESOLUTION OF THE RACEMATE S-(CARBOXYMETHYL)-(RS)-CYSTEINE (A)

Horst Bethge; Axel Kleemann, both of Hanau, and Jürgen Martens, Alzenau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,324
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134042
Int. Cl.³ C07C 99/12
U.S. Cl. 260—501.12 **13 Claims**

1. A process of resolving the racemate S-(carboxymethyl)-(RS)-cysteine comprising dissolving the racemate together with an optical isomer of 2-amino-1-phenyl-propan-1-ol in a solvent in which the salt of said optical isomer with one of the isomer present in said racemate is less soluble than the salt of said optical isomer with the other one of the isomers present in said racemate and precipitating the less soluble salt.

9. A compound which is either (1) a salt of S-(carboxymethyl)-(R)-cysteine and (1R,2S)-2 amino-1-phenyl-propan-1-ol or (2) a salt of S-(carboxymethyl)-(S)-cysteine and (1S,2R)-2-amino-1-phenyl-propan-1-ol.

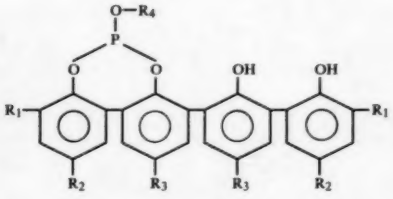
4,416,829
POLY-HINDERED PHENOL-PHOSPHITES AND PROCESS FOR PREPARATION

Richard J. Lee, Downers Grove; Adam S. Kurasiewicz, Wheaton, both of Ill., and Eugene E. Richardson, Kerrville, Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

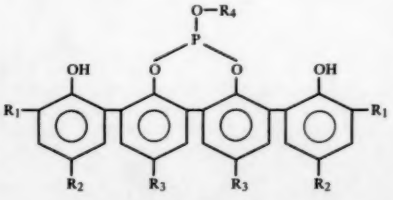
Filed Oct. 6, 1982, Ser. No. 433,009
Int. Cl.³ C07F 9/15
U.S. Cl. 260—927 R **11 Claims**

1. A mono-cyclic phosphite and dicyclic phosphite derived from a hexa-alkyl substituted phenol tetramer which have the structural formulae:

Monocyclic I:

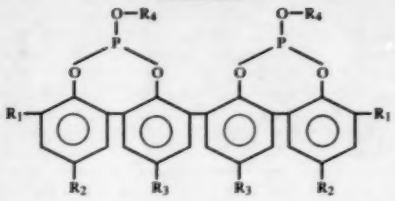


Monocyclic II:



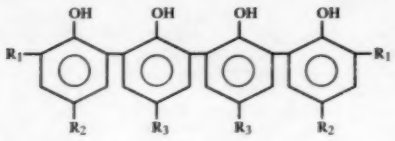
Dicyclic:

-continued



wherein R_4 is an alkyl hydrocarbon group containing one to four carbon atoms, the groups R_1, R_2, and R_3 are also alkyl hydrocarbon groups of a size such that the total carbon atom content for the six such groups is at least 42 carbon atoms.

8. The method of preparing a cyclic phosphite structure-containing compound of claim 1 which comprises reacting in the presence of a catalytic amount of iodine a poly-hindered phenol tetramer of the formula:



wherein the groups R_1, R_2, and R_3 are alkyl hydrocarbon groups whose total carbon content is at least 42; with a tri(C_1 to C_4 alkyl) phosphite used in at least a molar excess over the equimolar proportions for the mono-cyclic phosphite structural compounds and over the 1 to 2 molar proportions for the dicyclic phosphite structured compound reacted in the presence of an inert hydrocarbon diluent boiling between the temperatures of 35° C. and 175° C. and at the reaction temperature of above 50° C. but not exceeding 100° C. followed by removing at least the coproduct C_1 to C_4 alkanol and excess trialkyl phosphite.

4,416,830

POLYETHER PHOSPHORIC ACIDS OR ESTERS

Michael Morr, Braunschweig, and Maria-Regina Kula, Wolfenbüttel, both of Fed. Rep. of Germany, assignors to Gesellschaft fur Biotechnologische Forschung mbH (GBF), Braunschweig-Stockheim, Fed. Rep. of Germany

PCT No. PCT/EP80/00085, § 371 Date Mar. 3, 1981, § 102(e) Date Mar. 3, 1981, PCT Pub. No. WO81/00570, PCT Pub. Date Mar. 5, 1981

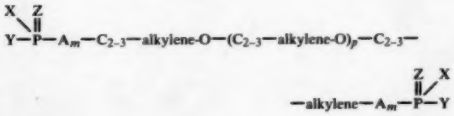
PCT Filed Aug. 28, 1980, Ser. No. 243,949

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1979, 2935134; Oct. 24, 1979, 2943016

Int. Cl.³ C07F 9/09, 9/165

U.S. Cl. 260—929 **5 Claims**

1. Compounds of the general formula:



wherein

p=30 to 800 and

(a1)

m=1, A=O atom.

X=OH and Y=X or —O—C_{1-5}-alkyl,

Z=O or S atom; or

(a2)

m=1,

A=O atom

X=

Y=X or —O—C_{1-5}-alkyl,

Z=O atom; or

(a3)

m=1,

A=O atom,

X=OH, Y=—S—C_{1-5}-alkyl, —S—C_{2-5}-alkyl amine, —S—C_{1-5}-alkyl carboxyl,

Z=O atom; or

(b)

m=1,

A=S atom,

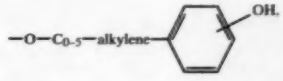
X=Y=OH,

Z=O atom; or

(c)

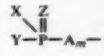
m=0,

X=Y=OH,



Z=O atom,

and their derivatives in which one of the two



groups is replaced by a C_{1-5} alkoxy group and the alkali metal derivatives and salts with ammonia and amines, of the acids of phosphorus and of the carboxylic acids.

4,416,831

AMINO AND SUBSTITUTED AMINO PHOSPHINYLALKANOYL COMPOUNDS

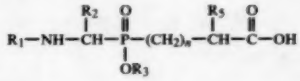
Edward W. Petrillo, Jr., Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 258,194, Apr. 27, 1981, Pat. No. 4,374,131. This application Nov. 1, 1982, Ser. No. 438,113

Int. Cl.³ C07F 9/32, 9/58, 9/65

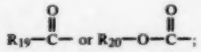
U.S. Cl. 260—938 **12 Claims**

1. A compound of the formula



wherein

R_1 is

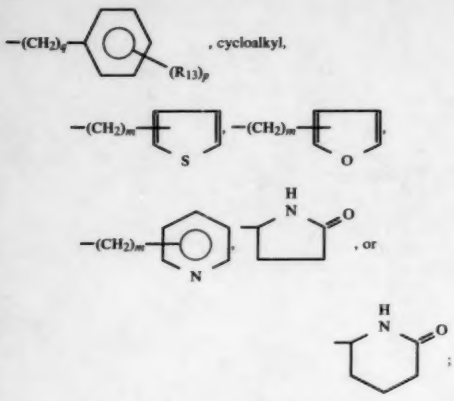


n is zero or one;

R_5 is hydrogen, lower alkyl, halo substituted lower alkyl, benzyl, or phenethyl;

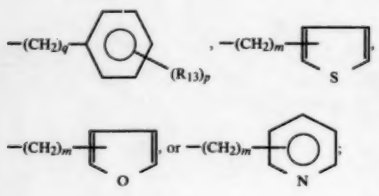
R_3 is hydrogen, lower alkyl, benzyl, or benzhydryl;

R_{19} is hydrogen, lower alkyl, halo substituted lower alkyl, amino substituted lower alkyl,



R_{20} is lower alkyl, phenyl, benzyl, or phenethyl;

R_2 is hydrogen, lower alkyl, lower alkenyl, halo substituted lower alkyl,



R_{13} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

q is zero or an integer from 1 to 7;

m is zero, one, two or three; and

p is one, two or three provided that p is more than one only if R_{13} is hydrogen, methyl, methoxy, chloro, or fluoro.

4,416,832

CYANOALKYLPHOSPHORIC ACID ESTER CHLORIDES

Bernd-Wieland Krüger; Hans-Jochem Riebel, both of Wuppertal; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

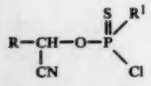
Filed Jan. 28, 1982, Ser. No. 344,263

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1981, 3106497

Int. Cl.³ C07F *9/14, 9/20, 9/42*

U.S. Cl. 260—940 **6 Claims**

1. A cyanoalkylphosphoric acid ester choride of the formula



R represents a hydrogen atom, an alkyl radical which is optionally substituted by halogen, C_1 to C_4 alkoxy, C_1 to C_4 alkylthio or C_1 to C_4 alkylamino and which has 1 to 20 carbon atoms, an optionally halogen-substituted C_2 to C_5 alkenyl or C_2 to C_5 alkinyl radical, a C_3 to C_8 cycloalkyl radical which is optionally substituted by C_1 to C_4 alkyl, C_1 to C_4 alkoxycarbonyl, phenoxybenzyloxycarbonyl and/or halogen, a phenyl-C_1 to C_4 alkyl radical which is optionally substituted by halogen, optionally halogen-substituted C_1 to C_4 alkyl or optionally halogen-substituted C_1 to C_4 alkoxy, a phenyl radical which is optionally substituted by halogen, nitro C_1 to C_4 alkyl, optionally halogen-substituted C_1 to C_4 alkoxy, optionally halogen-substituted C_1 to C_4 alkylthio or trifluoromethyl and/or by optionally halogen-substituted C_1 or C_2 alkylenedioxy, or represents a furyl, thienyl or pyridyl radical, and

R^1 represents an optionally halogen-substituted radical selected from C_1 to C_5 alkyl, C_2 to C_5 alkenyl, C_2 to C_5 alkinyl, phenyl, benzyl, C_1 to C_5 alkoxy, phenoxy, benzyloxy, C_1 to C_5 alkylthio, C_2 to C_5 alkenylthio, C_2 to C_5 alkinylthio, phenylthio, benzylthio, C_1 to C_5 alkylamino (monoalkylamino or dialkylamino), phenylamino or benzylamino.

4,416,833

SUBSTITUTED CARBONYL PHOSPHINYL-ALKANOYL COMPOUNDS

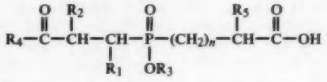
Donald S. Karanewsky, Princeton Junction, and Edward W. Petrillo, Jr., Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 260,659, May 4, 1981, Pat. No. 4,381,297. This application Nov. 26, 1982, Ser. No. 444,775

Int. Cl.³ C07F *9/32, 9/58*

U.S. Cl. 260—941 **6 Claims**

1. A compound of the formula



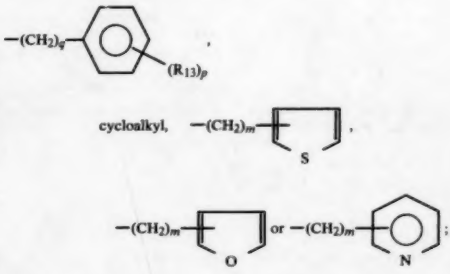
wherein

n is zero or one;

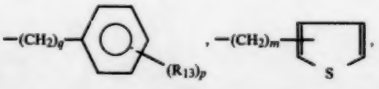
R_5 is hydrogen, lower alkyl, halo substituted lower alkyl, benzyl, or phenethyl;

R_3 is hydrogen, lower alkyl, benzyl, or benzhydryl;

R_4 is hydrogen, lower alkyl, halo substituted lower alkyl,



R_1 and R_2 are independently selected from the group consisting of hydrogen, lower alkyl, halo substituted lower alkyl,



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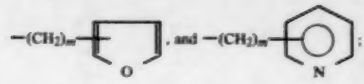


R_{13} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

q is zero or an integer from 1 to 7;

m is zero, one, two or three; and

p is one, two or three provided that p is more than one only if R_{13} is hydrogen, methyl, methoxy, chloro, or fluoro.

4,416,834

PROCESS FOR THE PREPARATION OF THIOPHOSPHORIC ACID ESTERS

Peter Feyen, Mettmann, and Friedrich Schmidt, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

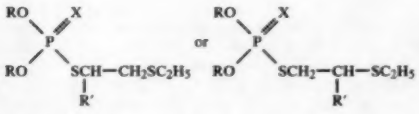
Filed Sep. 24, 1980, Ser. No. 190,288

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1979, 2941587

Int. Cl.³ C07F 9/165

U.S. Cl. 260—979 **6 Claims**

1. A process for the preparation of a compound of the formula



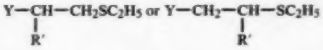
in which

R is alkyl,

X is oxygen or sulphur and

R′ is hydrogen or alkyl,

comprising reacting an ethylmercapto compound of the formula



in which

Y is chlorine or bromine, with about 1 to 1.02 times the molar amount of a thiophosphate of the formula

in which

M is a cation other than $NH_4\oplus$, in an aqueous heterogeneous reaction medium at a temperature between about 45° and 65° C. and at a pH between about 5 and 7.5.

4,416,835

DEVICE FOR RECEIVING A FREE FALLING LIQUID AND THE APPLICATION THEREOF IN A COUNTERCURRENT LIQUID AND GAS COOLING DEVICE

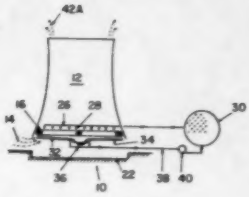
Jacques G. P. E. Bosne, Viroflay, France, assignor to Hamon-Sobelco, S.A., Brussels, Belgium

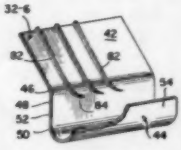
Division of Ser. No. 319,372, Nov. 9, 1981, Pat. No. 4,385,010. This application Jan. 3, 1983, Ser. No. 455,253

Claims priority, application France, Nov. 12, 1980, 80 24018

Int. Cl.³ B01F 3/04

U.S. Cl. 261—110 **4 Claims**





1. A device for receiving a liquid falling freely in the form of a shower or the like, comprising receiving wall means consisting of a wall inclined to the vertical and a main trough, extending along the lower edge of the wall, characterized in that said device comprises in the path of the liquid received by the inclined wall and before the liquid enters the bottom of the main trough, means for substantially reducing or eliminating the vertical velocity component of the liquid, wherein the means for substantially reducing or eliminating the vertical velocity component of the liquid comprise liquid deflecting surfaces which impart to the liquid before it reaches the bottom of the main trough a substantial velocity component in the direction of the flow of the liquid in the main trough, and wherein the deflecting surfaces are formed by ribs disposed on the inclined wall along the line of greatest slope, at least a part of said ribs being curved in the direction of the flow of the liquid in the main trough.

4,416,836

INDUCED DRAFT COOLING TOWER

Joachim R. Sinek, Pittsford, N.Y., assignor to Kennecott Corp., Cleveland, Ohio

Filed Dec. 3, 1981, Ser. No. 326,947

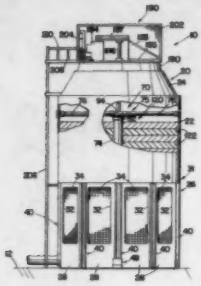
Int. Cl.³ B01F 3/04

U.S. Cl. 261—112 **13 Claims**

1. In a cooling tower wherein a heat exchanger in the form of a block of cellular packing is disposed and wherein fluid to be cooled is passed through the packing and cooling air is passed through the packing, the improvement comprising:

a unitary, seamless shell fabricated from a plastics material, the shell having a generally cylindrical upper portion and a polygonal lower portion, the lower portion including a plurality of air inlet openings and strengthening sections intermediate the air inlet openings, the air inlet openings

being formed in flat wall portions of the lower portion, the strengthening sections being in the form of corrugations,



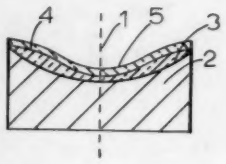
the corrugations and the remainder of the shell being of substantially uniform wall thickness.

4,416,837

SPIN CASTING OF CONTACT LENSES

Charles W. Neefe, 2701 Rebecca St., Big Spring, Tex. 79720

Filed Sep. 13, 1982, Ser. No. 417,641
Int. Cl.³ B29D *11/00*
U.S. Cl. 264—2.1 **4 Claims**



1. A method of spin casting contact lenses having equal amounts of asphericity on both the concave and convex lens surfaces and having no asphericity when in place on a spherical cornea by the steps providing a concave spin casting mold, placing a selected liquid monomer in the concave mold, rotating the concave mold and the selected liquid monomer at a selected speed to form an aspheric concave surface on the selected liquid monomer, allowing the selected liquid monomer to polymerize to form a solid aspheric optical surface, adhering to the concave mold, adding a liquid lens monomer to the concave aspheric mold and rotating the aspheric surfaced lens mold and the selected lens monomer at the selected speed to form a concave aspheric surface on the liquid lens monomer and a convex aspheric lens surface formed against the aspheric concave mold, allowing the rotating liquid lens monomer to polymerize to form a lens having an aspheric concave and convex surface, removing the aspheric lens from the aspheric concave mold.

4,416,838

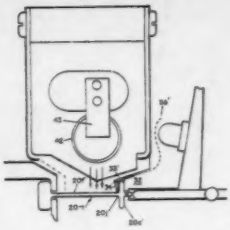
ASSEMBLAGES OF FASTENERS AND METHODS OF MANUFACTURE STRETCHING OF FASTENERS USING CONTACT HEAT

Joseph R. Paradis, Holden, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Feb. 5, 1982, Ser. No. 345,992
Int. Cl.³ B29C *17/02*
U.S. Cl. 264—25 **15 Claims**

1. The method of manufacturing an assemblage of fasteners which comprises the steps of:

(a) molding the assemblage as a set of connected individual fasteners, each individual attachment including an end member which is joined by a filament, and



(b) stretching at least one of the individual fasteners while a heated probe is in contact with the filament of said one fastener at a prescribed position along the length of its filament.

4,416,839

WHOLLY AROMATIC POLYESTER COMPOSITION, PROCESS FOR PRODUCTION THEREOF, AND PRODUCTION THEREFROM OF A FILM-LIKE OR FIBROUS ARTICLE OF A WHOLLY AROMATIC POLYESTER

Hiroo Inata, and Shunichi Matsumura, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

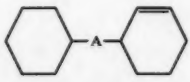
Filed Jul. 16, 1982, Ser. No. 399,009
Claims priority, application Japan, Jul. 20, 1981, 56-112256; Aug. 10, 1981, 56-124172; Feb. 22, 1982, 57-26063
Int. Cl.³ B29D *27/04*
U.S. Cl. 264—49 **11 Claims**

1. A process for producing a film-like or fibrous article of a wholly aromatic polyester, which comprises

(1) melt-molding a wholly aromatic polyester composition comprising

(a) 100 parts by weight of a wholly aromatic polyester containing as a main component at least one compound selected from the group consisting of aromatic dicarboxylic acids, aromatic dihydroxy compounds and aromatic hydroxycarboxylic acids, and

(b) from 5 to 300 parts by weight of a low-molecular-weight compound being substantially non-reactive with the wholly aromatic polyester and having a boiling point of at least about 200° C. under atmospheric pressure and a molecular weight of not more than 1,000, selected from the group consisting of imide compounds, isocyanurate compounds and diphenyl or the formula



wherein A represents —O—, —SO_2—, —CO— or are alkylene group, an the phenyl groups may be substitutes,

into an unstretched film-like or fibrous article, and

(2) removing at least a major portion of the low-molecular-weight compound from the unstretched film-like or fibrous article by extraction with an organic solvent capable of dissolving the low-molecular-weight compound but substantially incapable of dissolving the wholly aromatic polyester under the extracting conditions; or stretching the unstretched film-like or fibrous article, and after, as desired, the stretched article is heat-set, removing at least a major portion of the low-molecular-weight compound from the stretched article by extraction with an organic solvent having the same properties as above.

4,416,840

Al_2O_3 CERAMIC COMPOSITE

Minyoung Lee, Schenectady, and Lawrence E. Szala, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,903
Int. Cl.³ C04B 35/00
U.S. Cl. 264—60 10 Claims

1. A process for producing a sintered body comprised of an Al_2O_3 phase and a substoichiometric Ti_1C_x phase where x ranges from about 0.65 to about 0.95, said Ti_1C_x phase ranging from about 20% by weight to about 40% by weight of said sintered body and said Al_2O_3 phase ranging from about 80% by weight to about 60% by weight of said sintered body, said sintered body having a minimum Rockwell A hardness of about 92, which comprises forming a mixture composed of Al_2O_3, non-diamond elemental carbon and a titanium member selected from the group consisting of elemental titanium, titanium hydride and mixtures thereof, said titanium member being used in an amount wherein the titanium component is equivalent to from about 6.2 parts by weight to about 4.2 parts by weight of elemental titanium for each part by weight of said carbon, forming said mixture into a compact, subjecting the compact to a partial vacuum wherein at least at sintering temperature a significant portion of the residual vapor is carbon monoxide, and heating said subjected compact to a sintering temperature ranging from about 1750° C. to about 1850° C. producing said Ti_1C_x phase in situ and said sintered body, said TiH_2 decomposing completely at a temperature below sintering temperature to produce titanium and hydrogen gas, said mixture containing amounts of said Al_2O_3, said titanium member and said carbon which produce said sintered body, said partial vacuum sufficiently removing from the environment of said compact any gas generated during said heating which would have a significantly deleterious effect on said compact.

4,416,841

METHOD FOR CENTRIFUGAL CASTING OF THERMOSETTING PLASTICS

John E. Corea, 414 12th St., Lakewood, N.J. 08701; Emanuel R. Corea, 102 10th Ave., Belmar, N.J. 07719, and Irving Tashlick, 675 Ocean Ave., Long Branch, N.J. 07740

Division of Ser. No. 242,594, Mar. 11, 1981, Pat. No. 4,350,481. This application Sep. 13, 1982, Ser. No. 416,893
Int. Cl.³ B29C 5/04
U.S. Cl. 264—102 4 Claims

1. A method for centrifugally casting thermosetting plastics and the like, this method including the following steps:

(a) assembling and closing a plurality of casting molds each having an upper portion and a lower portion;

(b) placing a prepared dividing hub onto and over a plurality of drive pins provided on a spinner carried by a stationary base, said dividing hub having a top, a bottom and a plurality of sides and a reservoir within said dividing hub;

(c) engaging a plurality of prepared closed casting molds onto and over a like number of nozzles, each of said nozzles extending radially from the sides of said dividing hub wherein said hub as a conduit connecting an extreme tip of each of said nozzles with a bottom portion of the reservoir;

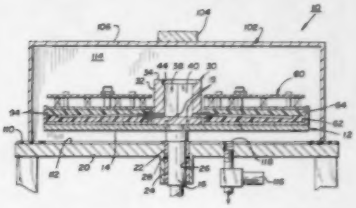
(d) placing a clamping means around the perimeter of the casting molds;

(e) closing and tightening the clamping means to retain the casting molds to the dividing hub during spinning of the hub and casting mold;

(f) pouring a pre-measured quantity of the thermosetting plastic into said reservoir in the dividing hub;

(g) moving a vacuum hood to the stationary base and with gasket means forming a vacuum chamber with said stationary base;

(h) evacuating the now closed vacuum chamber;



(i) spinning the casting molds wherein the thermosetting plastic material flows from the reservoir through the connecting conduit and then into the casting molds;

(j) stopping the spinning casting molds;

(k) venting the vacuum chamber;

(l) moving the vacuum hood to an open condition;

(m) releasing and opening the clamping means;

(n) curing the thermosetting plastic within the casting molds at a station remote from the apparatus;

(o) disassembling the casting molds, and

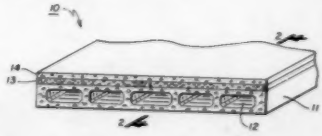
(p) removing the cast items from the molds after curing.

4,416,842

DIRECTED CRACKING IN CONCRETE PANEL MANUFACTURE

Richard C. Nash, New Prague, and Terrance W. Duffy, Minneapolis, both of Minn., assignors to Fabcon, Inc., Savage, Minn.

Filed Mar. 2, 1981, Ser. No. 239,330
Int. Cl.³ B28D 1/26
U.S. Cl. 264—145 7 Claims



1. In the method of manufacturing concrete panels wherein a length of substantially flat sandwich structure of concrete and insulation is formed, the structure having an upper concrete layer and a lower concrete support body layer, the insulation being carried intermediate the two, the concrete structure is cured, and then cut to form a plurality of individual panel lengths, the improvement comprising the step of forming indentations while the layer of concrete is still fluid and uncured, the indentations following the path of intended cuts, and subsequently after curing, cutting through the concrete structure along the indentations to form the individual panels, whereby undirected cracking in the upper surface is substantially eliminated.

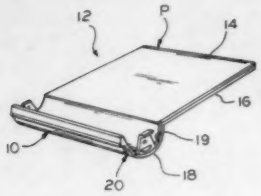
4,416,843
METHOD OF FORMING COMPOSITE DISPLAY PACKAGE

Charles R. Helms, Malvern, Pa., assignor to Container Corporation of America, Chicago, Ill.

Continuation-in-part of Ser. No. 261,586, May 7, 1981, abandoned. This application Oct. 15, 1982, Ser. No. 434,508

Int. Cl.³ B29C *17/10, 6/02*

U.S. Cl. 264—152 **1 Claim**



1. In a method for forming a plurality of composite carded display packages from a single blank of foldable paperboard, the steps comprising of:

(a) forming a score line intermediate of said blank to divide said blank into a pair of first and second panels;

(b) forming in the first panel of said blank sets of cut lines extending through said blank;

(c) forming in the second panel of said blank sets of apertures extending through said blank;

(d) folding one of said panels over the other and adhesively securing the panels to each other in face-to-face relation so that the apertures of said second panel are generally overlying and in alignment with the cut lines of said first panel;

(e) inserting said panels into a molding machine;

(f) forming pockets consisting of shells made integrally with and at one end of said panels and injecting plastic into said mold to substantially cover the shells to form plastic liners in said shells in the areas of each of said sets of cut lines and apertures to create a plurality of individual packages; and

(g) cutting said packages from said panels.

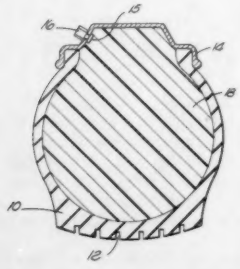
4,416,844
DEFLATION-PROOF PNEUMATIC TIRE AND ELASTOMERIC FILLINGS THEREFORE

Ransome J. Wyman, 821 Camino Calibri, Calabasas, Calif. 91302

Filed Dec. 23, 1980, Ser. No. 219,456

Int. Cl.³ B60C *7/00*

U.S. Cl. 264—267 **13 Claims**



1. A method for obtaining a deflation-proof tire, comprising:

filling a pneumatic tire casing to a pressure of at least 25 psi with a liquid solution prior to significant production of carbon dioxide, said solution comprising, in combination, a polyol, an organic polyisocyanate and water, in amounts sufficient to produce carbon dioxide and form a polyurethane elastomer containing polyurea, said pressure being sufficient to prevent bubble formation in the tire; and

curing said elastomer to maintain said carbon dioxide dissolved in said elastomer whereby to produce a substantially void-free elastomeric filling material within said casing.

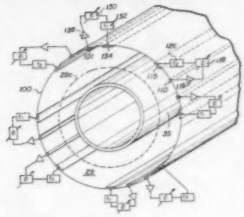
4,416,845
CONTROL FOR ORBITING CHARGED PARTICLES

Winfield W. Salisbury, Scottsdale, Ariz., assignor to Energy Profiles, Inc., Newtown Square, Pa.

Filed Aug. 2, 1979, Ser. No. 63,105

Int. Cl.³ G21B *1/00*

U.S. Cl. 376—107 **15 Claims**



9. In a fusion reaction system where ions from two sources spiral toward each other on common axis while rotating in opposite senses in orbital paths of common radii in an annular reaction zone of circular symmetry at any given cross section perpendicular to the axis of said paths and bounded by spaced apart outer and inner coaxial electrode walls for promoting collisions of ions in one beam with ions in the other beam, the improvement comprising:

(a) electrostatic field means operable in the absence of any effective magnetic fields for substantially limiting travel through said zone to orbital paths of the same radii with the walls of at least one of said electrodes having coolant courses connected to a coolant flow system and structure forming cavities in the larger of said electrodes, said cavities being connected to said reaction zone by slots in the walls of said larger electrode wherein the slots and connected cavities form passive systems at resonance relative to characteristics of flow of said ions and which establish focusing fields within the reaction zone to force said ions into paths of said radii.

4,416,846
NUCLEAR POWER PLANT WITH COOLING CIRCUIT

Hans Kastl, Neustadt an der Waldnaab, and Georg Gugel, Kalchreuth, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Continuation of Ser. No. 63,441, Aug. 3, 1979, abandoned. This application Jul. 17, 1981, Ser. No. 284,188

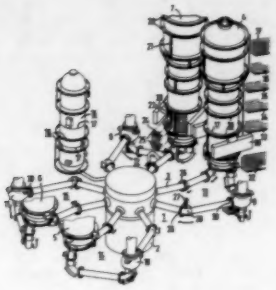
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1978, 2835082

Int. Cl.³ G21C *17/00*

U.S. Cl. 376—249 **13 Claims**

1. A nuclear power plant with a metallic, circulatory cooling loop formed with welding seams and including, as components thereof, a reactor pressure vessel, a heat consumer and a pump, as well as a coolant line connecting the components to one another, and thermal insulation provided on the cooling loop, the welding seams being testable by a track-traversing testing device, comprising a multiplicity of fixedly installed tracks

having like profile and being associated, respectively, with welding seams on the components and the cooling line, at least



part of the thermal insulation being in vicinity of said tracks and being formed as removable cassettes.

4,416,847

METHOD AND APPARATUS FOR DETECTING FAILURE OF NUCLEAR FUEL

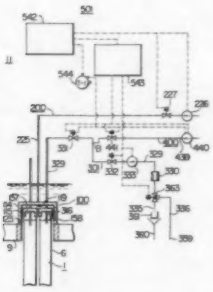
Shozo Saito, and Takeshi Suzumura, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 15, 1980, Ser. No. 178,596

Claims priority, application Japan, Aug. 20, 1979, 54-105041

Int. Cl.³ G21C *7/00*

U.S. Cl. 376—253 **14 Claims**



3. A method for detecting failure of nuclear fuel, which comprises a first step of projecting sampling conduits into fuel assemblies charged in a reactor core, a second step of stopping flow of cooling water passing through the fuel assemblies, a third step of keeping the fuel assemblies in a state of the flow of the cooling water being stopped for a predetermined period of time, a fourth step of supplying flushing water into the sampling conduits, thereby flushing the inside of the sampling conduits, a fifth step of discharging the flushing water existing in the sampling conduits therefrom at first discharge outlets after the fourth step, a sixth step of supplying the cooling water in the fuel assemblies into sample water receptacles from the sampling conduits at second discharge outlets, and a seventh step of setting the sample water receptacle to the second discharge outlets,, the third, fifth and sixth steps being continuously carried out in this order, and the seventh step being carried out after completion of the fourth step and before starting of the sixth step.

4,416,848

DEVICE FOR FIXING A GUIDE TUBE

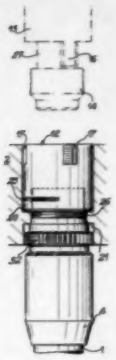
Claude Feutrel, Vauhallan, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 20, 1981, Ser. No. 265,601

Claims priority, application France, May 27, 1980, 80 11695

Int. Cl.³ G21C *19/20, 3/30*

U.S. Cl. 376—260 **5 Claims**



1. A device for the disassemblable fixing of a zircaloy guide tube of a fuel assembly of a nuclear reactor of the pressurized ordinary water type to the steel end plate of said assembly by means of a sleeve and an outer ferrule, wherein it comprises a ring nut having two threads with an opposite pitch, namely a first lower thread cooperating with the upper tucked part of the sleeve and ensuring the fixing of the latter in translation by gripping between two shoulders and a second upper thread cooperating with a tapped end fitting mounted at the end of a pole permitting its remote manipulation, a screwdriver sleeve with teeth, integral in rotation with the said pole, but mobile in translation by means of an elastic return system along the said pole between a first low position in which teeth on the screwdriver sleeve are located in recesses in the upper part of the ring which they in this way cause to rotate with the pole and the end fitting and a second high position where the said teeth are disengaged from the aforementioned recesses and where the ring and end fitting are independent in rotation, means for decelerating the rotation of the ring with respect to the sleeve and means for preventing any rotation of the sleeve and the guide tube with respect to the upper end plate during the fixing and disassembly operations.

4,416,849

NUCLEAR POWER PLANT

Raymond Magnin, Nanterre, France, assignor to Framatome, Courbevoie, France

Filed Oct. 6, 1980, Ser. No. 194,131

Claims priority, application France, Nov. 14, 1979, 79 28067

Int. Cl.³ G21C *9/00*

U.S. Cl. 376—296 **3 Claims**

1. Nuclear power plant constructed on a foundation (**28**), comprising

(a) a reactor building (**1**) containing a reactor core and a primary cooling circuit between said core and at least one steam generator;

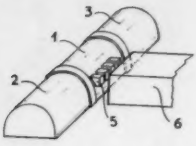
(b) a fuel building (**2**) for processing new and used fuel;

(c) ancillary buildings (**3**) for nuclear, electrical and safety equipment; and

(d) an engine building (**6**) for turbogenerator units;

(e) said buildings (**1, 2, 3, 6**) being arranged in the general shape of a T, said fuel building (**2**) and ancillary building (**3**) being arranged in line and adjacent either side of said reactor building (**1**) and perpendicular to the latter;

(f) a protective enclosure for at least said reactor building (1), said enclosure having a vault rigidly united with said foundation (28) so as to constitute a monolithic tubular assembly the thick lower part of which constitutes said



foundation, and so as to permit prestressing of said vault on said foundation, said vault having the shape of a cylinder with horizontal generatrices parallel to the longitudinal axis of said reactor building (1) and said ancillary buildings (3).

4,416,850

SYSTEM FOR COOLING THE ATMOSPHERE IN A PRIMARY CONTAINMENT VESSEL IN NUCLEAR REACTOR AND REMOVING WATER-SOLUBLE GASES AND DUSTS FLOATING THEREIN

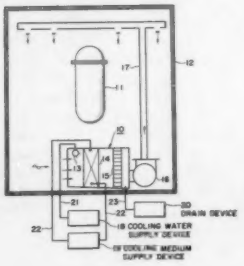
Tasuku Kodama, and Yoshiaki Taruishi, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa and Nippon Genshiryoku Jigyo Kabushiki Kaisha, Tokyo, both of, Japan

Continuation of Ser. No. 955,347, Oct. 27, 1978, abandoned. This application Jan. 28, 1981, Ser. No. 229,162

Claims priority, application Japan, Nov. 4, 1977, 52-132271

Int. Cl.³ G21C *15/18*

U.S. Cl. 376—310 **10 Claims**



1. A system for cooling the gaseous atmosphere in a primary containment vessel comprising:

casing means inside said primary containment vessel for controlling flow of gases within the primary containment vessel, said casing means having inlet means and outlet means;

means located adjacent said inlet means for spraying a first cooling liquid within said casing means;

heat exchanger means for cooling the gases positioned within said casing, said heat exchanger means being located downstream of said spraying means and spanning the interior of said casing means;

blower means connected to said casing means for causing gases to circulate through said casing means from said inlet means to said outlet means; and

means located downstream of said heat exchanger means for separating moisture and radioactive vapor from the gases;

said spraying means operating to spray said first cooling liquid directly onto said heat exchanger means to form a thin liquid film on the surface of said heat exchanger means, said casing means comprising an unrestricted opening between said spraying means and said heat exhanger means such that the first cooling liquid from said spraying means may form said thin liquid film on said heat exchanger means in a substantially unrestricted and unimpeded manner, said heat exchanger means having a second cooling liquid circulating therethrough, said spraying means being supplied with said first cooling liquid from a first cooling liquid supply device and said heat exchanger means being supplied with said second cooling liquid from a second cooling liquid supply device, whereby the thin liquid film formed on the outer surface of said heat exhanger means operates both to cool the gases passing within said casing means and to absorb radioactive water-soluble gases.

4,416,851

NUCLEAR FUEL FOR LIQUID METAL COOLED NUCLEAR REACTORS

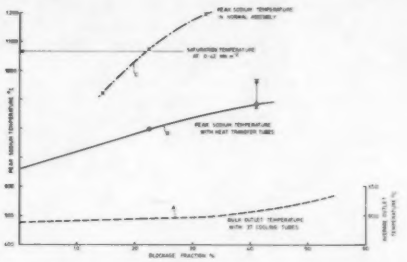
Edward Duncombe, Hale; Charles P. Gratton, Dorchester, and John Adamson, Blanford, all of England, assignors to United Kingdom Atomic Energy Authority, England

Filed Oct. 12, 1977, Ser. No. 841,568

Claims priority, application United Kingdom, Oct. 18, 1976, 43220/76

Int. Cl.³ G21C *3/16*

U.S. Cl. 376—399 **3 Claims**


PEAK SODIUM TEMPERATURE IN NORMAL ASSEMBLY
SATURATION TEMPERATURE AT 0.42 MN m⁻²
PEAK SODIUM TEMPERATURE WITH HEAT TRANSFER TUBES
MEAN OUTLET TEMPERATURE WITH 37 COOLING TUBES
BLOCKAGE FRACTION %

3. A nuclear fuel assembly for a liquid metal cooled nuclear reactor, said assembly comprising a tubular-walled fuel element wrapper defining a channel for coolant flow, a plurality of nuclear fuel pins supported in said wrapper in a spaced parallel array and coaxial with the axis of the channel formed by the wrapper and defining sub-channels between the pins for coolant flow, a plurality of open-ended heat transfer tubes empty of fuel and dispersed among said sub-channels with the axis of said tubes coaxial with the channel axis, a coolant inlet at one end of the channel and a coolant outlet at the other, and a transducer means for monitoring the average outlet temperature of coolant leaving the channel.

4,416,852

MULTI-ELEVATED NUCLEAR REACTOR SPACER GRID

Olov Nylund, Västeras, Sweden, assignor to AB Asea-Atom, Västeras, Sweden

Filed Mar. 3, 1981, Ser. No. 239,947

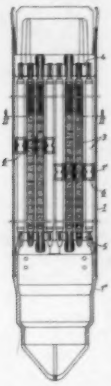
Claims priority, application Sweden, Mar. 17, 1980, 8002079

Int. Cl.³ G21C *3/34*

U.S. Cl. 376—438 **6 Claims**

1. A boiling water reactor fuel assembly comprising a plurality of vertical fuel rods, a fuel box having a rectangular cross-section, upper support means and lower support means for supporting said fuel rods within said box, a plurality of groups of spacer devices arranged between said upper and said lower support means, each of said groups of spacer devices positioning in said fuel box all of said fuel rods, each of said groups being composed of four separate spacer devices, each spacer device comprising a plurality of spacer grid cells, all spacer

grid cells of each spacer device being disposed at one and the same level, the total number of spacer grid cells in each of said spacer devices being less than one-half the number of said fuel



rods, the four separate devices of each of said groups being disposed at least at two different levels within said fuel box with each spacer device being at a corresponding corner of said fuel box.

4,416,853

CU-AG BASE ALLOY BRAZING FILLER MATERIAL

Masaki Morikawa; Hideaki Yoshida, both of Kasukabe; Kunio Kishida, Ohmiya, and Chuji Tanaka, Ageo, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP81/00189, § 371 Date Apr. 16, 1982, § 102(e) Date Apr. 16, 1982, PCT Pub. No. WO82/00790, PCT Pub. Date Mar. 18, 1982

PCT Filed Aug. 25, 1981, Ser. No. 373,498

Claims priority, application Japan, Sep. 1, 1980, 55-120870; Sep. 1, 1980, 55-120871; Oct. 6, 1980, 55-139535

Int. Cl.³ C22C 9/00

U.S. Cl. 420—469 8 Claims

1. A Cu-Ag alloy brazing filler material with low Ag content that exhibits excellent brazability and has a low vapor pressure consisting essentially of 5 to 35% by weight of Ag, 2.5 to 13% by weight of Si, with the balance being Cu and incidental impurities.

4,416,854

METHOD FOR KILLING WATER BORNE MICROORGANISMS

James W. Nielsen, Newport, Oreg., assignor to Sharon G. Nielsen, Newport, Oreg., a part interest

Continuation of Ser. No. 346,735, Feb. 8, 1982, abandoned, which is a continuation of Ser. No. 164,238, Jun. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 69,291, Aug. 24, 1979, Pat. No. 4,276,732. This application Mar. 29, 1983, Ser. No. 479,192

Int. Cl.³ A61L 2/16, 2/18; E03D 9/03; C02F 1/50

U.S. Cl. 422—29 4 Claims

1. A method for killing microorganisms including *E. coli* in a swimming pool, comprising:

intermixed chips of at least two electrolytically reactive elemental metals from a group including zinc, copper and lead;

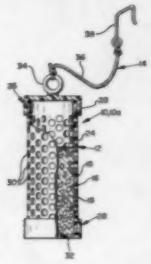
immersing said chips in contact with one another into said pool;

admitting water into interstices between said chips to electrolytically react the metals to produce a biocidal metal ion solution; and

releasing said solution into said pool to kill microorganisms therein, including *E. coli.*

2. A method for killing microorganisms including *E. coli* in the bowl of a toilet, comprising:

intermixing chips of at least two electrolytically reactive elemental metals from a group including zinc, copper and lead;



immersing said chips in contact with one another into the tank of said toilet;

admitting water into interstices between said chips to electrolytically react the metals to produce a biocidal metal ion solution; and

releasing said solution into said toilet bowl to kill microorganisms therein, including *E. coli.*

4,416,855

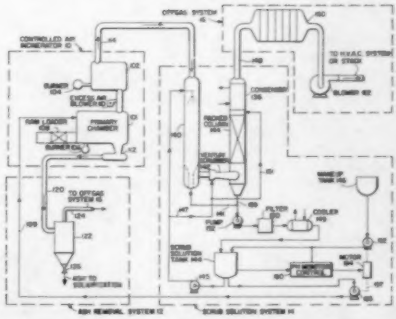
RADIOACTIVE WASTE TREATMENT APPARATUS

Richard F. Abrams, Westboro, Mass., and James G. Chellis, Centerport, N.Y., assignors to Koch Process Systems, Inc., Westborough, Mass.

Filed Feb. 9, 1981, Ser. No. 232,821

Int. Cl.³ B01D 53/34; B01J 19/24; G21F 9/00

U.S. Cl. 422—111 4 Claims



1. Radioactive waste treatment apparatus in which the waste includes a substantial amount of polyvinylchloride (PVC) comprising:

(a) an incinerator for burning said waste to produce an acidic gas effluent and an ash residue, said incinerator having a primary chamber and an afterburner chamber;

(b) scrubbing apparatus in fluid communication with said afterburner chamber for washing said gas effluent with scrubbing solution to entrap radioactive particulates in the gas and to neutralize said gas effluent;

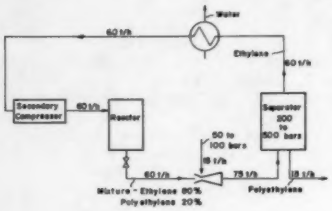
(c) a reservoir in fluid communication with a scrubbing

solution container and containing a supply of alkaline for said scrubbing solution;
(d) a scrubbing solution container in which said alkaline is mixed with said scrubbing solution;
(e) a first conduit means for coupling said scrubbing solution container to said scrubbing apparatus;
(f) a second conduit means for coupling scrubbing solution from said scrubbing solution container to the primary chamber of said incinerator where the scrubbing solution is reduced to water vapor and dry residue;
(g) coupling means for coupling the vapor to the afterburner chamber;
(h) disposal means coupled to said primary chamber for removing substantially all of the dry residue produced in the radioactive waste treatment process;
(i) control means for periodically feeding scrubbing solution to the second conduit.

4,416,856
PROCESS FOR THE POLYMERIZATION AND COPOLYMERIZATION OF ETHYLENE, USING A GAS INJECTOR DEVICE

Pierre Durand, Neuilly sur Seine; Pierre Charlon, Paris, and Guy Jouffroy, Lillebonne, all of France, assignors to Societe Chimique des Charbonnages—CdF Chimie, Paris, France

Continuation of Ser. No. 112,606, Jan. 16, 1980, abandoned, which is a division of Ser. No. 692,380, Jun. 3, 1976, Pat. No. 4,215,207. This application Feb. 22, 1982, Ser. No. 350,806
Claims priority, application France, Jun. 3, 1975, 75 17317
The portion of the term of this patent subsequent to Jul. 29, 1997, has been disclaimed.
Int. Cl.³ C08F *10/02*
U.S. Cl. 422—131 **2 Claims**

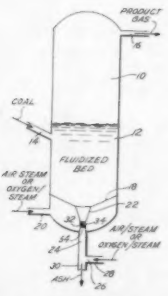


1. An apparatus for the polymerization or copolymerization of ethylene in the absence of a compressor used to raise the pressure of monomer to the level of a separator, said apparatus consisting essentially of:
(a) a reactor for polymerizing or copolymerizing said ethylene;
(b) an expansion valve connected to the outlet of said reactor for reducing the pressure of reaction mixture from said reactor;
(c) a gas injection device connected to the outlet of said expansion valve, said gas injection device comprising at least one assembly comprising an ejection nozzle having a progressively decreasing diameter in the downstream direction with a throat of cross-section A_1 at the downstream end of said nozzle, through which throat arrives said reaction mixture from said expansion valve, converging means defining a zone of progressively decreasing diameter in which said reaction mixture is mixed with a gaseous monomer, the upstream end of said means being concentric with, extending to the downstream end of, and having a larger diameter than the downstream end of said ejection nozzle, and a diffuser having (1) a throat of cross-section A_3, which diffuser throat is located at and connects the upstream end of said diffuser and the downstream end of said converging means, for bringing the mixture of reaction mixture and monomer to the pressure of said separator, said cross-section A_3 being the same as the cross-section of the downstream end of said converging means, and (2) means defining a zone of progressively increasing diameter whose upstream end is located at and has the same cross-section as said diffuser throat and whose downstream end constitutes the outlet of said device;
(d) a line connected to said converging means at its upstream end for supplying said gaseous monomer at a temperature lower than that of said reaction mixture and at a pressure below that of said separator, the upstream end of said converging means being open to fluid flow from only said ejection nozzle and the line;
(e) means for introducing monomer, at a temperature lower than that of said reaction mixture and at a pressure below that of said separator, into the line of paragraph (d);
(f) a separator, the separator being connected to the outlet of said gas injection device, said separator being a means for separating polymer and gaseous monomer in said mixture;
(g) a compressor connected to the outlet of said separator, said compressor being a means for compressing gaseous monomer separated from said mixture in said separator to the pressure of said reactor;
(h) a line connected between said compressor and said reactor, said line being a means for carrying said compressed gaseous monomer from the outlet of said compressor to said reactor; and
(i) a polymer discharge line connected to said separator.

4,416,857
FLUIDIZED BED GASIFIER OR SIMILAR DEVICE FOR SIMULTANEOUS CLASSIFICATION OF ASH AND UNREACTED COAL

Karl S. Vorres, Western Springs, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 288,158, Jul. 29, 1981, Pat. No. 4,369,045. This application Aug. 16, 1982, Ser. No. 408,226
Int. Cl.³ C10J *3/56*; F27B *15/00*
U.S. Cl. 422—145 **8 Claims**

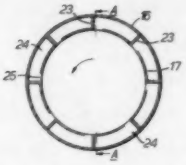


1. An apparatus including a fluidized bed reactor with means for fluidizing hydrocarbonaceous particles therewithin and with means for withdrawing agglomerated solids from the fluidized bed of solid hydrocarbonaceous particles, comprising, in combination:
(a) a venturi connected to the bottom of the fluidized bed reactor for receiving agglomerated solids, said venturi having a top end and a bottom end and a constricted opening therebetween, said constricted opening having an upper end and a lower end;
(b) at least one spiral ridge positioned on the interior surface of said constricted opening, said spiral ridge being of a greater width at said upper end of said constricted opening than at said lower end of said constricted opening; and
(c) means for passing a gas stream upwardly into the bottom of the fluidized bed through the venturi.

4,416,858
CONTACTOR

Lee F. Robinson, London, England, and Giuliano Porcari, Edmonton, Canada, assignors to RTL Contactor Holding S.A., Switzerland

Continuation of Ser. No. 161,299, Jun. 20, 1980, abandoned.
This application Aug. 9, 1982, Ser. No. 406,448
Claims priority, application United Kingdom, Jun. 22, 1979, 7921906
Int. Cl.³ B01D 11/02, 11/04
U.S. Cl. 422—259 17 Claims

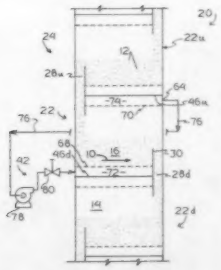


1. A contactor for continuously contacting a first flowable stream with a second flowable stream, said contactor including:
(a) a tubular rotor having a generally cylindrical internal surface;
(b) means for mounting said rotor for rotation about its axis; and
(c) means for directing said streams as separate phases into and through the interior of said rotor,
(d) said rotor including bucket-forming means comprising partitions arranged parallel to and transverse to said axis dividing said rotor into a plurality of rings of buckets bounded internally by said internal surface, whereby the buckets are contiguous and present a smooth profile to the phases through which they travel,
(e) each said bucket having an opening in said generally cylindrical internal surface at the leading part of said bucket with respect to the direction of rotation of said rotor.

4,416,859
COUNTERCURRENT SOLIDS-FLUID CONTACTOR

Lloyd C. Brown, and Rudi Klasen, both of San Diego, Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Feb. 17, 1981, Ser. No. 235,146
Int. Cl.³ B01D 11/02
U.S. Cl. 422—261 10 Claims

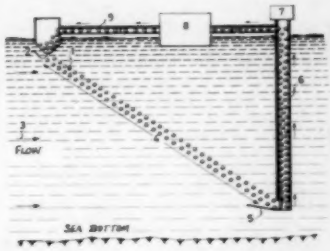


1. A countercurrent solids-fluid contactor comprising:
a tower having means for defining a plurality of stages disposed one above the other;
means in communication with the uppermost stage for introducing particulate solids;
means for introducing fluid into the lowermost stage; and
passage means for allowing fluid to flow upwardly between each pair of vertically adjacent stages and for allowing particles to flow downwardly between each pair of vertically adjacent stages;
each said stage including recirculation means substantially independent of said passage means for drawing fluid from the upper portion of each stage and recirculating it into the bottom of the same stage in such a manner as to fluidize particles within the stage;
each said stage including an associated means for keeping the quantity of particles on a given stage substantially fixed independently of the rate of particle flow from stage to stage through the passage means during operation of the contactor so that the particles receive uniform contacting.

4,416,860
METHOD AND APPARATUS FOR RECOVERING RAW MATERIAL, ESPECIALLY URANIUM, FROM NATURAL WATERS, ESPECIALLY FROM THE SEA

Dieter Heitkamp, Jülich, and Peter Inden, Aachen, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation of Ser. No. 104,812, Dec. 18, 1979, abandoned.
This application May 12, 1981, Ser. No. 262,829
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1978, 2854679
Int. Cl.³ B01D 15/02; C02F 1/28
U.S. Cl. 423—6 17 Claims



11. A method of concentrating a trace material dissolved in a body of water having a bottom and having a layer with a natural current by accumulation of the trace material on the surface areas of carrier bodies, said carrier bodies having a density greater than that of water, the method comprising the steps of:
discharging the carrier bodies into the body of water at a discharge station positioned in spaced relation to the bottom of the layer;
allowing the carrier bodies to sink through a layer while being transported horizontally by the current;
accumulating the trace material on the exposed surface areas of the carrier bodies by adsorption as the carrier bodies sink and are transported by the current;
intercepting the carrier bodies before the carrier bodies reach the bottom by collecting the carrier bodies downstream of the discharge station after the carrier bodies have sunk through at least a portion of the layer and have accumulated trace materials thereon;
removing trace material from the carrier bodies after the carrier bodies have been collected, and
returning the carrier bodies with the trace material removed therefrom upstream to the discharge station for subsequent discharge to again adsorb trace material in the layer of the body of water as the current brings additional trace material into proximity of the carrier bodies.

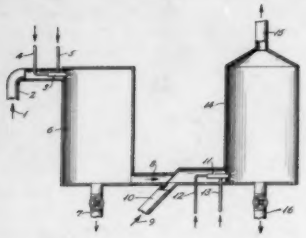
12. The method of claim 11 wherein the trace material is uranium and the body of water is seawater.

4,416,861

TWO STAGE ODOR CONTROL SYSTEM

Egbert deVries, Kettering, Ohio, assignor to Quad Environmental Technologies Corp., Highland Park, Ill.

Filed Apr. 29, 1982, Ser. No. 373,250
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—210 **20 Claims**



1. A method for treating vapors arising out of process operations containing offensive or foul smelling odor constituents,
some of said vapors being of high intensity or concentrated odors and the remainder being of low intensity or dilute odors,
conveying the high intensity odor vapors into the upper portion of a first treatment zone,
treating the high intensity odor vapors with at least one first aqueous spray for a time sufficient to remove the odor constituents from said vapors,
the first aqueous spray comprising droplets in the range of 5 to 20 microns in diameter and having a flow rate in the range of 0.5 to 1 gal/min to produce 6×10^6 to 1×10^9 droplets per cfm,
removing aqueous liquid from the bottom of the first treatment zone,
removing treated first vapors from the lower portion of the first treatment zone,
combining the treated first vapors with the low intensity odor vapors,
introducing the combined vapors into the lower portion of a second treatment zone via an inlet,
contacting said combined vapors near the inlet with at least one second aqueous spray,
treating the combined vapors in the second zone with said spray for a time sufficient to remove the odor constituents,
the second aqueous spray comprising droplets in the range of 5 to 20 microns in diameter and having a flow rate in the range of 1 to 2 gal/min to produce 1×10^8 to 1×10^9 droplets per cfm,
removing liquid from the bottom of the treatment zone, and
removing the treated combined vapors from the top portion of the second treatment zone.

4,416,862

PROCESS FOR THE PREPARATION OF ALUMINIUM TRICHLORIDE AND SILICON DIOXIDE BY CHLORINATION OF ALUMINA WITH SILICON TETRACHLORIDE

Dinko Gencev, Sofia, Bulgaria; Katalin Szabo nee Mogyorosi, Tatabanya; Szilard Riederauer, Budapest, and Janos Szepvölgyi, Tatabanya, all of Hungary, assignors to Tatabanyai Szenbanyak, Tatabanya, Hungary

Filed Jan. 20, 1982, Ser. No. 340,997
Claims priority, application Hungary, Jan. 20, 1981, 116/81
Int. Cl.³ C01F *7/56*
U.S. Cl. 423—335 **6 Claims**

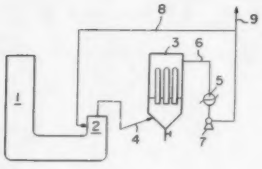
1. Process for the preparation of aluminium trichloride and silicon dioxide by chlorination of an alumina containing material with silicon tetrachloride consisting essentially of reacting alumina or a material essentially consisting of alumina with silicon tetrachloride as a single chlorinating agent at a temperature exceeding 400° C., separating unreacted silicon tetrachloride from the aluminium trichloride obtained and recycling same into the chlorination step, isolating silicon dioxide from the solid residue essentially consisting of the unreacted alumina and silicon dioxide, by dissolving alumina and separating silicon dioxide by filtration, converting the dissolved alumina into alumina and recycling the so converted alumina into the chlorination step while continuously removing the aluminium trichloride obtained.

4,416,863

METHOD FOR SYNTHESIZING AMORPHOUS SILICON NITRIDE

Kimihiko Sato, Yokohama; Kunihiko Terase, Tokyo; Hitoshi Kijimuta, Ebina, and Yukinori Ohta, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jul. 2, 1982, Ser. No. 394,862
Claims priority, application Japan, Jul. 21, 1981, 56-112971
Int. Cl.³ C01B *21/06*; B01D *59/08*
U.S. Cl. 423—344 **2 Claims**



1. A two stage method for synthesizing amorphous silicon nitride, comprising reacting in the first stage silicon halide and ammonia in a reaction vessel for about 0.1 to 3 seconds at a temperature range of about 400° C. to 1600° C. in a molar ratio of ammonia to silicon halide of about 0.1 to 5 in the absence of oxygen to produce amorphous silicon nitride, and then separating in the second stage silicon nitride with ammonia halide which was produced in the first stage simultaneously with said amorphous silicon nitride, using a separating device wherein cool gas at a temperature of 150° C. or below containing therein neither oxygen nor moisture is introduced resulting in the collection of solid amorphous silicon nitride and condensed ammonium chloride without adhering into the separating device and other component parts thereof in any substantial amount.

4,416,864

PROCESS FOR CALCIUM HYPOCHLORITE

John A. Wojtowicz, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Sep. 30, 1982, Ser. No. 429,754
Int. Cl.³ C01B *11/06*; C01F *11/24*
U.S. Cl. 423—474 **14 Claims**

1. A process for preparing calcium hypochlorite from lime containing insoluble impurities which comprises:
(a) reacting an aqueous solution of hypochlorous acid with said lime to form a reaction mixture comprised of dibasic calcium hypochlorite crystals, said insoluble impurities and unreacted lime;
(b) separating coarse dibasic calcium hypochlorite crystals from a slurry comprised of an aqueous calcium hypochlorite solution containing fine insolubles comprised of fine crystals of dibasic calcium hypochlorite, said unreacted lime and said insoluble impurities;
(c) separating said fine insolubles from said aqueous calcium hypochlorite solution;

(d) washing said coarse dibasic calcium hypochlorite crystals with said aqueous calcium hypochlorite solution and recovering said wash solution;
(e) recombining said fine insolubles with said wash solution to form a slurry of fine insolubles;
(f) reacting said slurry of fine insolubles with an aqueous solution of hypochlorous acid to produce additional calcium hypochlorite in solution;
(g) separating the calcium hypochlorite solution from the remaining insoluble impurities;
(h) reacting said calcium hypochlorite solution and hypochlorous acid with the washed dibasic calcium hypochlorite crystals to produce an aqueous paste of hemibasic calcium hypochlorite crystals;
(i) reacting said aqueous paste of hemibasic calcium hypochlorite crystals with sufficient concentrated alkali metal hydroxide and sufficient chlorine to form a paste of neutral calcium hypochlorite dihydrate crystals; and
(j) drying said aqueous paste of calcium hypochlorite dihydrate crystals to produce dry granular calcium hypochlorite.

4,416,865

RADIOPHARMACEUTICALS FOR LOCALIZATION OF THROMBOEMBOLIC DISEASE

Buck A. Rhodes, and William R. Bell, both of Baltimore, Md., assignors to Research Corporation, New York, N.Y.

Filed Feb. 20, 1973, Ser. No. 333,802
Int. Cl.³ A61K *49/00, 43/00*
U.S. Cl. 924—1.1 **14 Claims**

1. A process for preparing a radioactive enzymatic compound consisting of urokinase and technetium-99m comprising:
preparing a saline solution containing technetium-99m ions;
reducing the technetium-99m ions contained in said solution by the addition of $FeCl_3$ in an acidic solution;
adding ascorbic acid to the solution;
adjusting the pH of the solution to a basic condition;
adding urokinase to the solution;
adjusting the pH of the solution to an acidic condition; and,
separating the technetium-99m labeled urokinase from the solution.

12. The radio labeled thrombolytic enzyme ^{99m}Tc-Urokinase.

4,416,866

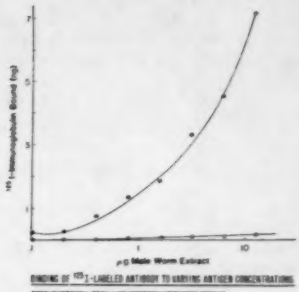
DIAGNOSIS AND TREATMENT OF FLUKE INFECTIONS WITH MONOCLONAL ANTIBODIES

Mette Strand, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Aug. 28, 1981, Ser. No. 297,290
Int. Cl.³ G01N *33/00*
U.S. Cl. 424—1.1 **9 Claims**

1. A screening method for the determination of a fluke infection of a warm-blooded animal which comprises testing a body component selected from the group consisting of serum, urine, milk and feces for the presence of glycoprotein molecules bound by antibodies produced by fused cell hybrid ATCC HB-8087 or fused cell hybrid ATCC HB-8086.

8. A method of combating fluke infection which comprises injecting a warm-blooded animal with a mixture of antibodies



BINDING OF ^{125}I-LABELED ANTIBODY TO VARYING ANTIGEN CONCENTRATIONS

THE CONCENTRATIONS OF MALE WORM PROTEIN EXTRACT ARE INDICATED.

corresponding to the antibodies produced by fused cell hybrids ATCC HB-8086, ATCC HB-8087 and ATCC HB-8088.

4,416,867

ORAL COMPOSITIONS

Thomas W. Ritchey, Norwood; John M. Weaver, Glen Rock, and Martin Sapone, Tenafly, all of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 235,247, Feb. 17, 1981, Pat. No. 4,339,432, which is a continuation-in-part of Ser. No. 50,392, Jun. 20, 1979, abandoned, which is a continuation-in-part of Ser. No. 50,393, Jun. 20, 1979, abandoned. This application Feb. 10, 1982, Ser. No. 347,597
Int. Cl.³ A61K *7/16*
U.S. Cl. 424—49 **9 Claims**

1. A toothpaste composition having a pH of about 4.5 to about 8.0 comprising a physiologically acceptable zinc salt or zinc glycinate in an amount sufficient to provide about 0.2% to about 3% by weight of the composition of soluble zinc ions wherein said zinc salts may have a tendency to produce the organoleptically displeasing effect of astringency; and glycine at a level of about 0.1% to about 4% by weight, based on the total weight of the composition as the essential effective agent reducing astringency or said glycine serving to effectively solubilize said zinc salts at a pH of about 8 or above.

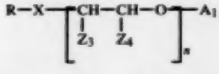
4,416,868

COSMETIC EXCIPIENT

Guy Vanlerberghe, Montjay-la-Tour, and Henri Sebag, Paris, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Aug. 8, 1975, Ser. No. 602,962
Claims priority, application Luxembourg, Aug. 12, 1974, 70720
Int. Cl.³ A61K *7/042, 7/021, 7/025*
U.S. Cl. 424—59 **28 Claims**

1. A compound in the form of an oil or wax having the formula



wherein
R is selected from the group consisting of alkyl having 7 to 20 carbon atoms, the hydrocarbon residue of lanolin when X is oxygen and the hydrocarbon residue of lanolic acid when X is

X represents a member selected from the group consisting of oxygen and carbonyloxy having the formula

linked to R through the free bond of the carbon atom of the carbonyloxy group,

one of Z_3 and Z_4 represents hydrogen and the other represents $—CH_2—Y_1—R'_1$ wherein Y_1 represents a member selected from the group consisting of $—CH_2—$, oxygen and carbonyloxy of the formula

linked to R'_1 through the free bond of the carbon atom of the carbonyloxy group and R'_1 represents alkyl having from 7 to 20 carbon atoms with the proviso that R'_1 can have different values in the said repeating units of a given compound of said formula in (a);

A_1 is selected from the group consisting of hydrogen and when Y_1 is carbonyloxy a mixture of hydrogen and

wherein R'_1 has the meaning given above; and

n is a whole or decimal number greater than 1 and lower than or equal to 10.

4,416,869

METHOD FOR ELIMINATING OR REDUCING THE DESIRE FOR SMOKING

Emanuel Revici, New York, N.Y., assignor to The Vinoxen Company, New York, N.Y.

Continuation of Ser. No. 74,455, Sep. 11, 1979, abandoned, which is a continuation of Ser. No. 923,657, Jul. 11, 1978, abandoned, which is a continuation of Ser. No. 724,366, Sep. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,207, Sep. 22, 1975, abandoned. This application Nov. 20, 1981, Ser. No. 323,634

Int. Cl.³ A61K *31/20, 31/23, 33/04*

U.S. Cl. 424—164 **15 Claims**

1. A method for treating or aiding in the treatment of a tobacco habit or addiction in a human by controlling the craving for tobacco or controlling tobacco withdrawal symptoms, which comprises internally administering to said human an amount effective to control said craving or said withdrawal symptoms of an oxidized, sulfurized oil, produced by the process comprising heating in the presence of oxygen and elemental sulfur and at a temperature of from about 120° C. to about 130° C., an oil comprising at least one fatty acid or fatty ester having allylic unsaturation of at least one of the types

$$—CH=CH—CH_2—CH=CH—$$

or

$$—CH=CH—CH=CH—CH_2—$$

for a period of time sufficient to produce a peroxide titer substantially greater than the peroxide titer of said oil prior to oxidation.

4,416,870

ANTIBIOTIC COMPOUND, ITS PRODUCTION AND ITS MEDICINAL USE

Karl G. Metzger; Jörg Pfitzner; Delf Schmidt, all of Wuppertal; Horst Weyland, Bremerhaven; Günter Benz, Velbert, and Theo Schröder, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

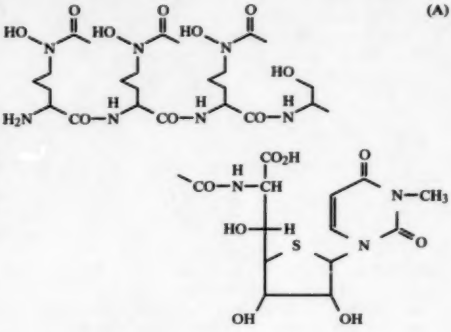
Filed Jan. 18, 1982, Ser. No. 340,418

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1981, 3102136

Int. Cl.³ C07C *103/52;* **A61K** *31/495*

U.S. Cl. 424—172 **10 Claims**

1. An antibiotic compound which, in the iron-free form, is of the formula



(A)

4,416,871

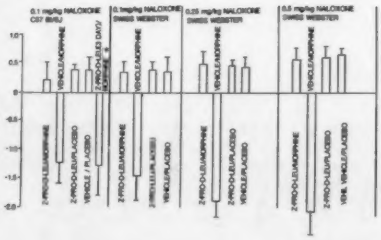
INHIBITION BY PEPTIDES OF TOLERANCE TO AND PHYSICAL DEPENDENCE ON MORPHINE

Roderich W. Walter, Chicago, Ill.; William A. Krivoy, Lexington, Ky.; Ronald F. Ritzmann, Chicago, and Hemendra N. Bhargava, Wheaton, both of Ill., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 124,676, Feb. 26, 1980, abandoned, which is a continuation of Ser. No. 46,701, Jun. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 923,187, Jul. 10, 1978, abandoned. This application Jan. 11, 1982, Ser. No. 338,537

Int. Cl.³ A61K *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **10 Claims**



1. An analgesic composition comprising morphine and a dipeptide selected from the group consisting of Pro-Leu, D-Pro-D-Leu, D-Pro-Leu, Pro-D-Leu, Pro-Gln, Pro-Ser, Pro-Met, Pro-ΔPhe, and Pro-Tyr, the dipeptide being present in amount sufficient to inhibit the development of tolerance to

and physical dependence on the morphine without substantial alteration of its analgesic properties.

4,416,872

TREATMENT OF MALARIA WITH LIPOSOMES CONTAINING 8-AMINOQUINOLINE DERIVATIVES AND GLYCOCONJUGATES

Carl R. Alving, Washington, D.C., and Edgar A. Steck, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 17, 1982, Ser. No. 359,012
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 64 Claims

1. A An antimalarial composition comprising a glycoconjugate selected from the group consisting of:

(a) a glycolipid having a terminal carbohydrate moiety selected from the group consisting of glucosyl, galactosyl and lactosyl;

(b) a glycolipid having a terminal carbohydrate moiety selected from the group consisting of glucosyl, galactosyl and lactosyl encapsulated within a liposome selected from the group consisting of a phospholipid and cholesterol-containing liposome, and a phospholipid, cholesterol and a charged (lipophilic) amphipathic compound-containing liposome;

(c) a glycoprotein selected from the group consisting of fetuin, asialofetuin, orosomucoid and asialoorosomucoid encapsulated within a liposome selected from the group consisting of phospholipid and cholesterol-containing liposome, and a phospholipid, cholesterol and a charged (lipophilic) amphipathic compound-containing liposome;

(d) a glycolipid having a terminal carbohydrate moiety selected from the group consisting of glucosyl, galactosyl and lactosyl encapsulated within a liposome selected from the group consisting of a phospholipid and cholesterol-containing liposome, and a phospholipid, cholesterol and a charged (lipophilic) amphipathic compound-containing liposome wherein each said liposome contains an 8-aminoquinoline selected from the group consisting of primaquine and a pharmaceutically-acceptable acid addition salt thereof; and

(e) a glycoprotein selected from the group consisting of fetuin, asialofetuin, orosomucoid and asialoorosomucoid encapsulated within a liposome selected from the group consisting of a phospholipid and cholesterol-containing liposome, and a phospholipid, cholesterol and a charged (lipophilic) amphipathic compound-containing liposome wherein each said liposome contains an 8-aminoquinoline selected from the group consisting of primaquine and a pharmaceutically-acceptable acid addition salt thereof.

4,416,873

COMBINED ALLANTOIN-HYDROLYZED ANIMAL PROTEIN SKIN PREPARATION

Eugene Puchalski, Jersey City; Frances A. Donahue, Middletown, and Richard P. Dixon, Aberdeen, all of N.J., assignors to Charles of the Ritz Group Ltd., New York, N.Y.

Continuation of Ser. No. 383,404, Jun. 1, 1982, Pat. No. 4,374,766. This application Dec. 13, 1982, Ser. No. 449,117
The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.
Int. Cl.³ A61K *7/06, 7/15, 7/46, 7/48*
U.S. Cl. 424—177 14 Claims

1. A stable soothing hydroalcoholic skin preparation comprising a combined allantoin-hydrolyzed animal protein product in an amount of at least about 0.5% by weight, and panthenol, urea, ethanol or isopropyl alcohol and water, and optionally one or more humectants, preservatives, fragrances and solubilizing agents for the fragrances, said allantoin remaining in solution, without crystallizing out, for extended periods of time.

4,416,874

INJECTABLE COMPOSITIONS OF BBM-928A

Murray A. Kaplan, Syracuse, and Edward C. Shinal, Manlius, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Mar. 5, 1982, Ser. No. 354,998
Int. Cl.³ A61K *37/02*
U.S. Cl. 424—177 8 Claims

1. A pharmaceutical composition suitable for intravenous injection comprising a sterile aqueous solution containing from 1 mg. to 5 mg. of BBM 928A per milliliter, and sufficient of a pharmaceutically acceptable water soluble base to solubilize said BBM 928A and confer a pH value of from pH 11.0 to 11.5 upon said solution wherein said base is selected from the group consisting of sodium hydroxide, trisodium phosphate, sodium carbonate, pyrrolidine, triethylamine, piperidine, glucosamine, N-methylglucamine, and the sodium salt of an organic acid selected from the group consisting of glycine, aspartic acid, cysteine, phthalic acid, succinic acid, and tyrosine.

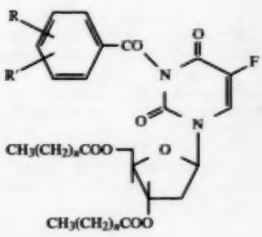
4,416,875

ESTER DERIVATIVES OF DEOXYFLUOROURIDINE

Setsuro Fujii, Toyonaka; Bompei Yasui, Ikoma; Mitsuo Nakamura, Kyoto; Tomohisa Miyamoto, Settsu; Kazuko Ando, Hirakata; Iwao Hashimoto, Osaka; Yoneichi Sawai, Kadoma; Naoki Umeda, Osaka, and Masahiro Kawasaki, Kashihara, all of Japan, assignors to Funai Yakuhin Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 6, 1981, Ser. No. 290,420
Claims priority, application Japan, Aug. 13, 1980, 55-112102
Int. Cl.³ A61K *31/70*; C07H *19/08*
U.S. Cl. 424—180 13 Claims

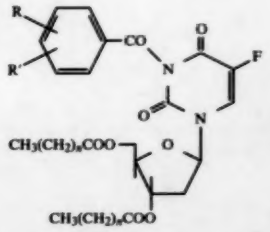
1. An ester derivative of deoxyfluorouridine of the general formula (I):



(I)

wherein R and R′, which may be identical or different, are selected from the group consisting of a hydrogen atom, a halogen atom, and a methyl group and n is 3 or 4.

7. A pharmaceutical composition containing, as an active ingredient an effective anti-tumor amount of, an ester derivative of deoxyfluorouridine of the general formula:



wherein R and R′, which may be identical or different, are selected from the group consisting of a hydrogen atom, a

halogen atom and a methyl group and n is 3 or 4 and a pharmaceutically acceptable carrier or diluent.

4,416,876

PARA-AMINO BENZOIC AND PHENYLACETIC ACID DERIVATIVES

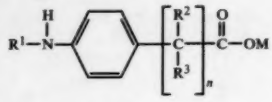
Sandor Barcza, and Faizulla G. Kathawala, both of Mt. Lakes, N.J., assignors to Sandoz, Inc., East Hanover, N.J.

Filed May 19, 1982, Ser. No. 379,739

Int. Cl.³ C07F 7/10

U.S. Cl. 424—184 **35 Claims**

1. A compound of the formula:



in which

R^1 is a mono-silicon-containing hydrocarbyl radical having up to 35 carbon atoms;

each of R^2 and R^3 is, independently, a hydrogen atom or lower alkyl having from 1 to 3 carbon atoms;

n is 0 or 1; and

M is a hydrogen atom, an equivalent of a cation which forms a non-toxic, pharmaceutically acceptable salt, or a non-toxic, pharmaceutically-acceptable monovalent radical which is hydrolyzable or saponifiable to an alkali metal cation.

4,416,877

ANTI-ATHEROSCLEROTIC PHARMACEUTICAL COMPOSITIONS CONTAINING DIPHOSPHONATE COMPOUNDS

Craig L. Bentzen, Chavannes de Bogis; Lan N. Mong, Nyon, and Eric Niesor, Gland, all of Switzerland, assignors to Symphar S.A., Geneva, Switzerland

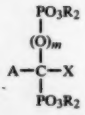
Continuation-in-part of Ser. No. 114,423, Jan. 22, 1980, Pat. No. 4,309,364. This application Oct. 9, 1981, Ser. No. 310,314

Claims priority, application United Kingdom, Feb. 13, 1979, 794992; Sep. 25, 1979, 7933157

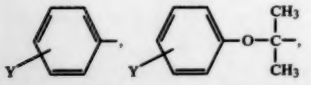
Int. Cl.³ A61K 31/66

U.S. Cl. 424—204 **12 Claims**

1. A pharmaceutical composition having anti-atherosclerotic activity by reducing tissue lipids and favorably altering plasma lipids, which comprises as active ingredient an antiatherosclerotically effective amount of a diphosphonate ester compound of the formula

 (I)

wherein X is H or OH; m is zero or 1, R is CH_3 or C_2H_5 but when m is zero and X is OH then R is only CH_3; and A is selected from the group consisting of



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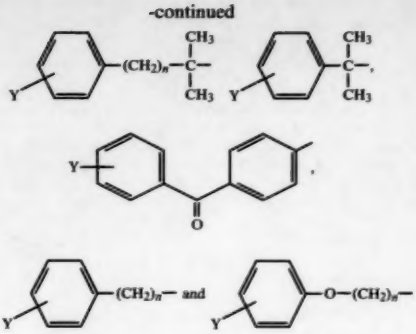
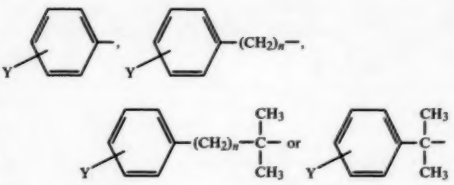


where n is an integer from 1 to 6 and Y is H, CH_3, OCH_3 or halogen, A being other than



when m is zero, and a pharmaceutically acceptable excipient.

4,416,878

[8-(DIALKYLAMINO ALKOXY)-CAFFEINE]-PLATINUM COMPLEXS COMPOUNDS AND PHARMACEUTICAL PRODUCTS CONTAINING THE SAME

Josef Klosa, Jänickestrasse 13, D-1000 Berlin, Fed. Rep. of Germany

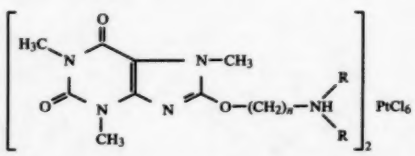
Filed Dec. 4, 1981, Ser. No. 327,712

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046927

Int. Cl.³ A61K 31/515; C07D 473/12

U.S. Cl. 424—245 **2 Claims**

1. Di-[8-(dialkylamino alkoxy)-caffeine]-hexachloroplatinates of the formula:



wherein n is 2 or 3 and R is a straight or branched alkyl having from 1 to 3 carbon atoms.

2. A pharmaceutical composition for the treatment of malignant tumors containing as the active ingredient a cytostatically effective amount of the compound of claim **1** together with a pharmaceutically acceptable carrier.

4,416,879

CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Yoshikazu Inoue, Amagasaki; Masayoshi Murata, Mino, and Hisashi Takasugi, Kohamanishi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

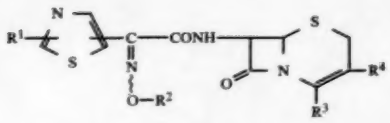
Filed Aug. 27, 1981, Ser. No. 296,860

Claims priority, application United Kingdom, Sep. 8, 1980, 8028933

Int. Cl.³ C07D 501/36; A61K 31/545

U.S. Cl. 424—246 21 Claims

1. A compound of the formula:



wherein R^1 is amino or a protected amino group;

R^2 is a saturated 4 to 8-membered heteromonocyclic group containing one sulfur atom selected from the group consisting of thietanyl, thiolanyl, thianyl, thiepanyl and thiocanyl;

R^3 is carboxy or a protected carboxy group, and

R^4 is hydrogen, lower alkyl, or a group of the formula:

$$-CH_2R^{4a}$$

wherein

R^{4a} is alkanoyloxy, alkoxycarbonyloxy, alkanesulfonyloxy, benzenesulfonyloxy, tosyloxy, benzoyloxy, toluoyloxy, xyloyloxy, naphthoyloxy, phthaloyloxy, indancarbonyloxy, phenyl(lower)alkanoyloxy, benzyl- and phenethyl- oxycarbonyloxy, a heterocyclicthio group wherein the heterocyclic group is selected from:

unsaturated 3 to 8-membered heteromonocyclic group containing 1 to 4 nitrogen atoms,

saturated 3 to 8-membered heteromonocyclic group containing 1 to 4 nitrogen atoms,

unsaturated condensed heterocyclic group containing 1 to 5 nitrogen atoms,

unsaturated 3 to 8-membered heteromonocyclic group containing 1 to 2 oxygen atoms and 1 to 3 nitrogen atoms,

saturated 3 to 8-membered heteromonocyclic group containing 1 to 2 oxygen atoms and 1 to 3 nitrogen atoms,

unsaturated condensed heterocyclic group containing 1 to 2 oxygen atoms and 1 to 3 nitrogen atoms,

unsaturated 3 to 8-membered heteromonocyclic group containing 1 to 2 sulfur atoms and 1 to 3 nitrogen atoms,

saturated 3 to 8-membered heteromonocyclic group containing 1 to 2 sulfur atoms and 1 to 3 nitrogen atoms,

unsaturated 3 to 8-membered heteromonocyclic group containing 1 to 2 sulfur atoms,

unsaturated 3 to 8-membered heteromonocyclic group containing an oxygen atom,

unsaturated 3 to 8-membered heteromonocyclic group containing an oxygen atom and 1 to 2 sulfur atoms,

unsaturated condensed heterocyclic group containing 1 to 2 sulfur atoms, and

unsaturated condensed heterocyclic group containing an oxygen atom and 1 to 2 sulfur atoms,

said heterocyclicthio group substituted with lower alkyl, lower alkenyl or lower alkynyl, pyridinio, or pyridinio substituted with carbamoyl, with the proviso that R^3 is COO^- when R^{4a} is pyridinio or carbamoyl-substituted pyridinio, and pharmaceutically acceptable salts thereof.

4,416,880

β-LACTAM ANTIBIOTICS AND COMPOSITIONS CONTAINING THE SAME

Michael Boberg, and Karl G. Metzger, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

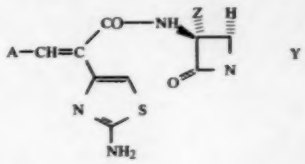
Filed Sep. 21, 1981, Ser. No. 304,280

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1980, 3037997

Int. Cl.³ C07D 499/70; A61K 31/545, 31/43; C07D 501/22, 501/36

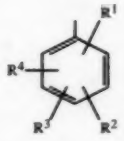
U.S. Cl. 424—246 8 Claims

1. A β-lactam compound of the formula



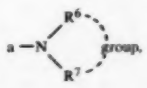
in which

A is a hydrogen atom, an alkyl, alkenyl, alkinyl or cycloalkyl group with up to 18 carbon atoms which may be substituted by double bonded oxygen, nitrogen, sulphur or by alkoxy with up to 2 carbon atoms or by dimethylamino; or naphthyl or a phenyl radical of the formula



wherein

R^1, R^2, R^3 and R^4 independently of one another denote a hydrogen or halogen atom, an alkyl, alkenyl, alkinyl or cycloalkyl group with up to 6 carbon atoms, a $—OCOR^5$ group,

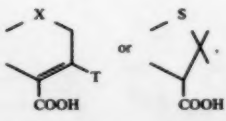


or a hydroxyl, trifluoromethyl, nitro, cyano, C_1 to C_6 alkoxy, C_1 to C_6 alkylthio, hydroxycarbonyl, (C_1 to C_6 alkoxy)-carbonyl, aminocarbonyloxy, sulphonyl or sulpho group, wherein

R^5 denotes a branched or unbranched alkyl, alkenyl or alkinyl group with up to 6 carbon atoms and wherein

R^6 and R^7 independently of one another are a hydrogen atom, or together or independently of one another denote an alkyl, alkenyl, alkinyl, cycloalkyl group or an alkanoyl group with 1–6 carbon atoms, or a heterocyclic 5-membered or 6-membered ring with 1–4 heteroatoms which may be substituted by methyl and wherein

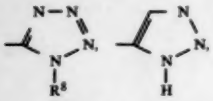
Y is

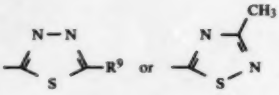


X is a sulphur or oxygen atom,

T denotes a hydrogen atom, a C_1 to C_4 alkyl group, a halogen atom or a C_1 to C_4 alkoxy, hydroxymethyl, formyloxymethyl, (C_1 to C_4 alkyl)-carbonyloxymethyl, aminocarbonyloxymethyl, pyridiniummethyl, 4-carbamoylpyridiniummethyl or heterocyclylthiomethyl group, wherein

"heterocyclyl" represents a radical of the formula





wherein

R^8 denotes a hydrogen atom or a methyl, 2-dimethylaminoethyl, carboxymethyl, or sulphomethyl group and

R^9 denotes a hydrogen atom or a methyl group and wherein

Z denotes a hydrogen atom or a C_1 to C_6 alkoxy group, or an ester or salt thereof.

5. A method of combating bacterial illnesses in human and non-human animals which comprises administering to the animals an antibacterially effective amount of a compound according to claim 1.

4,416,881
INSECT REPELLENTS EMPLOYING CYCLOHEXANE-CARBONYL MORPHOLINE COMPOUNDS

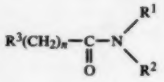
Terrence P. McGovern, Bowie, Md., and Carl E. Schreck, Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 40,253, May 18, 1979, Pat. No. 4,298,612, which is a division of Ser. No. 8,814, Feb. 2, 1979, Pat. No. 4,291,041. This application Mar. 19, 1981, Ser. No. 245,464

Int. Cl.³ A01N *43/84*

U.S. Cl. 424—248.54 5 Claims

1. A method of providing clothing with effective repellency to mosquitoes comprising applying to clothing an effective mosquito repellent amount of a compound of the formula



wherein R^3 is one of the groups A or B

(A)

(B)

R^1 and R^2 taken together with the N is selected from the group consisting of

when R^3 is

and n is zero and when R^3 is

and n is the integer one, two, or three.

4,416,882
DI(ALKYLAMINO) DERIVATIVES OF CHLORONITROPYRAZINES USEFUL AS ADJUNCTS TO RADIATION THERAPY

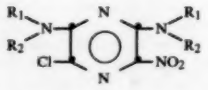
George D. Hartman, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 194,091, Oct. 6, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,503

Int. Cl.³ C07D *241/16;* A61K *31/495*

U.S. Cl. 424—250 8 Claims

1. A compound of the formula:



wherein

R_1 is C_1–C_6 hydroxyalkyl, C_1–C_6 dihydroxyalkyl, C_1–C_6 alkoxy alkyl and

R_2 is hydrogen or R_1.

4,416,883
PENICILLIN DERIVATIVES

Peter H. Bentley, Horsham, England, assignor to Beecham Group Limited, England

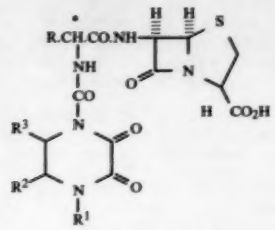
Filed Jun. 24, 1981, Ser. No. 277,031

Claims priority, application United Kingdom, Jun. 26, 1980, 8020954

Int. Cl.³ A61K *31/495;* C07D *499/70*

U.S. Cl. 424—250 9 Claims

1. A compound of formula (I) or a pharmaceutically acceptable salt or in vivo hydrolysable ester thereof:


(I)

wherein R is phenyl, 4-hydroxy phenyl, or a 5- or 6-membered heterocyclic ring containing up to three heteroatoms selected from oxygen, sulphur or nitrogen, optionally substituted with hydroxy, amino, halogen or C_{16} alkoxy;

R^1 represents hydrogen or C_{1-6} alkyl;

R^2 and R^3 are the same or different and represent hydrogen, C_{1-6} alkyl, halogen, amino, hydroxy, or C_{1-6} alkoxy.

8. A pharmaceutical composition having antibacterial activity comprising an antibacterially effective amount of a compound as claimed in claim **1** together with a pharmaceutical carrier or excipient.

4,416,884

PIPERAZINYLBENZOHETEROCYCLIC COMPOUNDS

Hiroshi Ishikawa; Fujio Tabusa, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

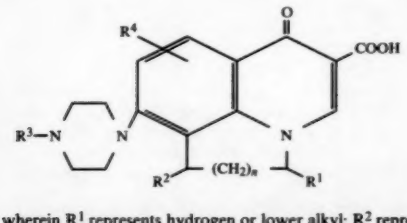
Continuation-in-part of Ser. No. 28,788, Apr. 10, 1979, abandoned. This application Oct. 9, 1980, Ser. No. 195,691

Claims priority, application Japan, Apr. 12, 1978, 53-43624; Sep. 7, 1978, 53-110464; Nov. 16, 1978, 53-141785; Nov. 24, 1978, 53-145638; Aug. 31, 1978, 53-107387; Nov. 6, 1978, 53-137157; Nov. 17, 1978, 53-142731; Oct. 11, 1979, 54-131630

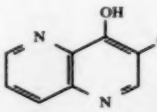
Int. Cl.³ A61K *31/495*; **C07D** *401/04*

U.S. Cl. 424—250 **64 Claims**

1. A piperazinylbenzoheterocyclic compound represented by the formula (I)


(I)

wherein R^1 represents hydrogen or lower alkyl; R^2 represents hydrogen; R^3 represents hydrogen, lower alkyl, lower alkanoyl, lower alkylsulfonyl, phenylalkyl wherein the alkyl moiety contains 1 to 4 carbon atoms, benzoyl, p-toluenesulfonyl, a group represented by the formula



lower alkyl substituted with one to three of halogen and hydroxy, lower alkanoyl substituted with one to seven of halogen selected from the group consisting of fluorine, chlorine and bromine, phenylalkyl substituted with one to three of lower alkoxy on the phenyl ring, lower alkylsulfonyl substituted with one to three of halogen, lower alkenyl or lower alkynyl; R^4 represents hydrogen or halogen, and n is an integer of 0 or 1, except that when n is 0, R^1 and R^2 together can represent the atoms necessary to form a cyclohexane ring, and when R^3 represents lower alkyl substituted with one to three of halogen and hydroxy, lower alkanoyl substituted with one to seven of halogen selected from the group consisting of fluorine, chlorine and bromine, phenylalkyl substituted with one to three of lower alkoxy on the phenyl ring, lower alkylsulfonyl substituted with one to three of halogen, lower alkenyl or lower alkynyl, n is 1; or a pharmaceutically acceptable salt thereof.

60. An antimicrobial composition comprising an antimicrobially effective amount of a piperazinylbenzoheterocyclic compound of claim **1**.

4,416,885

USE OF ISOPROPYLAMINOPYRIMIDINE IN THE CHEMOTHERAPY OF MUSCULAR DYSTROPHY, MYOPATHY AND MYOTONIA

Pierre M. Huve, 3, rue Cernuschi, 75017 Paris, France

Continuation-in-part of Ser. No. 201,709, Oct. 29, 1980, Pat. No. 4,344,947. This application Mar. 22, 1982, Ser. No. 360,497

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.³ A61K *31/505*

U.S. Cl. 424—251 **5 Claims**

1. A method for the chemotherapy of muscular dystrophy, myopathy, and myotonia which comprises:

administering to an animal afflicted with a condition associated with muscular dystrophy, myopathy or myotonia 2-isopropylanimopyrimidine or therapeutically acceptable salts of the same in an amount effective to improve said condition.

4,416,886

METHOD OF TREATING PRURITIS AND COMPOSITION THEREFOR

Joel E. Bernstein, Deerfield, Ill., assignor to Dermall Limited, Northbrook, Ill.

Filed Jul. 29, 1981, Ser. No. 288,166

Int. Cl.³ A61K *31/485*

U.S. Cl. 424—260 **9 Claims**

1. A method for relieving severe itching in patients in need of such treatment, said method comprising topically administering a therapeutically effective amount of naloxone or a pharmaceutically acceptable salt thereof or naltrexone to a patient in need of such treatment.

4,416,887

1-[3-(6-FLUORO-1,2-BENZISOXAZOL-3-YL)PROPYL]-4-HYDROXYL-4-PHENYLPIPERIDINES TO TREAT PAIN

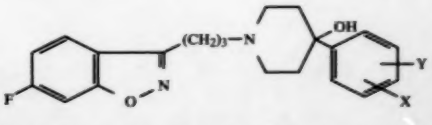
Larry Davis, Sergeantsville, and Joseph T. Klein, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 366,247, Apr. 9, 1982, Pat. No. 4,396,770. This application May 18, 1983, Ser. No. 495,559

Int. Cl.³ A61K *31/445*

U.S. Cl. 424—267 **2 Claims**

1. A method of alleviating pain comprising administering to a mammal in need of pain alleviation a pain alleviating effective amount of a compound of the formula



wherein X is hydrogen, loweralkyl of 1 to 5 carbon atoms, loweralkoxy of 1 to 5 carbon atoms, halogen or trifluoromethyl; Y is hydrogen or trifluoromethyl with the proviso that

Y is hydrogen when X is hydrogen, loweralkyl of 1 to 5 carbon atoms, loweralkoxy of 1 to 5 carbon atoms, or trifluoromethyl and Y is hydrogen or trifluoromethyl when X is halogen; the optical antipode thereof, or a pharmaceutically acceptable acid addition salt thereof.

4,416,888

3-(2-(4-PIPERIDYL)-1-ALKYL-ETHYL)-INDOLES AND THEIR USE AS MEDICAMENTS

Gerard R. Le Fur, Plessis Robinson, and Francois Audiau, Charenton, both of France, assignors to Pharmindustrie, Gennevilliers, France

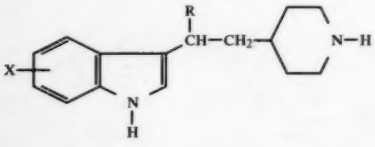
Filed May 3, 1982, Ser. No. 374,365

Claims priority, application France, May 22, 1981 [FR] France, 8110220

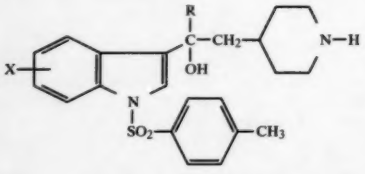
Int. Cl.[3] **A61K** *31/395;* **C07D** *101/06*

U.S. Cl. 424—267 **4 Claims**

1. A process for the preparation of a compound of the formula:

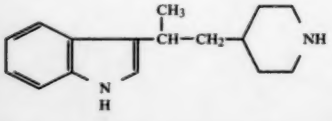


wherein R represents alkyl having 1 to 3 carbon atoms and X represents hydrogen or halogen which comprises reacting a compound of the formula:



with a metallic hydride in an ester or a mixture of an ether and a hydrocarbon, at a temperature between 0° C. and the boiling point of the solvent.

2. A medicament useful as an agent for inhibiting serotonin uptake and for serotonin release comprising an effective amount of a compound of the formula:



or its salt with a pharmaceutically acceptable acid together with a pharmaceutically effective carrier.

4,416,889

COMBATING FUNGI WITH N-ALLENYL-ACETANILIDES

Jörg Stetter; Winfried Lunkenheimer, both of Wuppertal, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

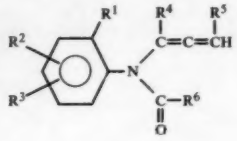
Division of Ser. No. 136,026, Mar. 31, 1980, Pat. No. 4,385,069. This application Sep. 20, 1982, Ser. No. 420,682

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916692

Int. Cl.[3] **A01N** *43/64, 43/80;* **C07D** *249/08, 261/18*

U.S. Cl. 424—269 **7 Claims**

1. An N-allenyl-acetanilide of the formula



in which

R^1 represents hydrogen, alkyl with up to 4 carbon atoms, or halogen,

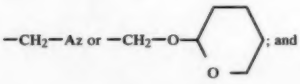
R^2 represents hydrogen or alkyl with up to 4 carbon atoms,

R^3 represents hydrogen or alkyl with up to 4 carbon atoms,

R^4 represents hydrogen or alkyl with up to 4 carbon atoms,

R^5 represents hydrogen or alkyl with up to 4 carbon atoms,

R^6 represents furyl, tetrahydrofuryl, thiophenyl or tetrahydrothiophenyl; isoxazolyl which is optionally substituted by alkyl with up to 4 carbon atoms;



Az represents pyrazol-1-yl, 1,2,4-triazol-1-yl or imidazol-1-yl.

5. A fungicidal composition containing as active ingredient a fungicidally effective amount of a compound according to claim **1** in admixture with a diluent.

4,416,890

BENZOTHIAZOLESULFONAMIDE DERIVATIVES FOR THE TOPICAL TREATMENT OF ELEVATED INTRAOCULAR PRESSURE

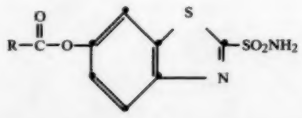
Otto W. Woltersdorf, Jr., Chalfont, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 282,470, Jul. 13, 1981, abandoned, and Ser. No. 352,400, Feb. 25, 1982, abandoned. This application May 21, 1982, Ser. No. 380,571

Int. Cl.[3] **C07D** *277/80;* **A61K** *31/425*

U.S. Cl. 424—270 **14 Claims**

1. A compound of the formula:



where R is C_1 to C_{18} alkyl; C_3 to C_6 cycloalkyl; C_3 to C_6 cycloalkyl C_1 to C_{18} alkyl; C_1 to C_{18} alkyl C_3 to C_6 cycloalkyl; C_1 to C_{18} haloalkyl; aryl where the aryl group is selected from the group consisting of phenyl, naphthyl, pyridinyl, furanyl, and thiophenyl, and said aryl group can be substituted with one

or more substituents selected from the group consisting of C_1 to C_{10} alkyl, halo, and C_1 to C_4 alkoxy; arylalkyl where the alkyl moiety has from 1 to 4 carbon atoms and the aryl moiety can be unsubstituted or substituted with halogen or C_1 to C_3 alkyl and said aryl moiety is selected from the group consisting of phenyl, naphthyl, pyridinyl, furanyl, and thiophenyl; C_2 to C_{18} hydroxyalkyl; C_2 to C_{18} amino alkyl; C_2 to C_6 alkenyl; C_2 to C_6 alkynyl and aryl C_2 to C_6 alkenyl.

4,416,891

ESTER OF 6-[(HEXAHYDRO-1H-AZEPIN-1-yl)METHYLENEAMINO]PENICILLANIC ACID, AND ITS USE AS ANTIBACTERIAL AGENT

Fumio Sakamoto, Osaka; Shoji Ikeda, Ibaraki, and Goro Tsukamoto, Toyonaka, all of Japan, assignors to Kanebo Ltd., Tokyo, Japan

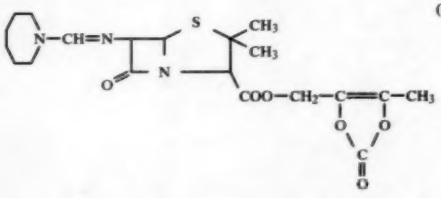
Filed Jul. 16, 1982, Ser. No. 399,132

Claims priority, application Japan, Jul. 18, 1981, 56-112508

Int. Cl.³ C07D *499/00*; A61K *31/425*

U.S. Cl. 424—270 **2 Claims**

1. (5-Methyl-2-oxo-1,3-dioxolen-4-yl)methyl 6-[(hexahydro-1H-azepin-1-yl)methyleneamino]penicillanate of the following formula (I)



(I)

or a pharmaceutically acceptable acid addition salt thereof.

4,416,892

METHOD OF TREATING HYPERSENSITIVITY DISEASE WITH BENZOXAZOLE DERIVATIVES

William Dawson, Camberley, England, assignor to Lilly Industries Limited, London, England

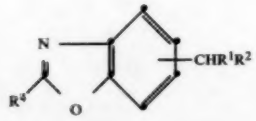
Filed Apr. 14, 1982, Ser. No. 368,079

Claims priority, application United Kingdom, Apr. 23, 1981, 8112538

Int. Cl.³ A61K *31/42*

U.S. Cl. 424—272 **3 Claims**

1. A method for the therapeutic treatment of an immediate hypersensitivity disease, which comprises administering to a mammal, including a human, a compound of the following formula



(I)

in which the group $—CHR^1R^2$ is in the 5- or 6- position of the benzoxazole nucleus, R^1 is hydrogen or C_{1-4} alkyl, R^2 is selected from the group —COOH or a salt or ester thereof, the group $—CONH_2$ and the group $—CH_2OH$, and in which R^4 is a phenyl group optionally substituted by one or two groups selected from halogen, C_{1-4} alkoxy, C_{1-4} alkyl and C_{1-4} haloalkyl, or optionally substituted in two adjacent positions by methylenedioxy.

4,416,893

SUBSTITUTED 1,2,5-OXADIAZOLE-2-OXIDES IN HUMAN CARDIOVASCULAR SYSTEM DISEASE

Karl Schönafinger; Rudi Beyerle; Anton Mogilev, all of Frankfurt am Main; Helmut Bohn, Schöneck; Piero Martorana, Bad Homburg, and Rolf-Eberhard Nitz, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 24, 1981, Ser. No. 246,954

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012862

Int. Cl.³ A61K *31/42*

U.S. Cl. 424—272 **9 Claims**

1. A pharmaceutical composition useful for treating or preventing human cardiovascular-system disease and comprising a pharmacologically-active component and physiologically-acceptable pharmacologically-inert excipient, the pharmacologically-active component comprising from 0.01 to 20 percent by weight, based on the total composition weight, of a 1,2,5-oxadiazole-2-oxide having the structure of (a) the 3-methyl ester of 1,2,5-oxadiazole-2-oxide-3,4-dicarboxylic acid, (b) 3-methyl-1,2,5-oxadiazole-2-oxide-4-carboxylic acid-anilide or (c) 4-methyl-1,2,5-oxadiazole-2-oxide-3-carboxylic acid-anilide.

4,416,894

ORGANIC COMPOUNDS

Christopher R. J. Woodhouse, London, England, assignor to Sandoz Ltd., Basel, Switzerland

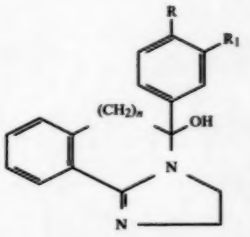
Filed Jan. 25, 1982, Ser. No. 342,064

Claims priority, application United Kingdom, Jan. 30, 1981, 8102952

Int. Cl.³ A61K *31/415*, *31/435*

U.S. Cl. 424—273 R **2 Claims**

1. A method of treating urinary frequency, urgency or incontinence which comprises orally administering to a patient in need of such treatment an effective amount of a compound of formula I



I

in which

n is 0 or 1 and

R and R_1 which may be the same or different, are hydrogen, fluorine or chlorine,

in free base form or in the form of a pharmaceutically acceptable acid addition salt.

4,416,895

IMIDAZOLE DERIVATIVES AND SALTS THEREOF, THEIR SYNTHESIS AND INTERMEDIATES AND PHARMACEUTICAL FORMULATIONS

Peter B. Thorogood, London, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

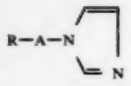
Division of Ser. No. 67,109, Aug. 17, 1979, which is a continuation-in-part of Ser. No. 952,796, Oct. 19, 1978, abandoned, Ser. No. 952,774, Oct. 19, 1978, abandoned, and Ser. No. 8,101, Jan. 31, 1979, abandoned, said Ser. No. 952,796, is a continuation-in-part of Ser. No. 936,407, Aug. 24, 1978, abandoned, said Ser. No. 952,774, is a continuation-in-part of Ser. No. 936,406, Aug. 24, 1978, Pat. No. 4,284,641. This application Apr. 2, 1981, Ser. No. 250,454

Claims priority, application United Kingdom, Feb. 1, 1978, 3984/78

Int. Cl.³ A61K *31/415*

U.S. Cl. 424—273 R 4 Claims

1. A method of, treatment or prophylaxis of angina pectoris in a mammal which comprises administering to the mammal an effective angina pectoris treatment or prophylaxis amount of a compound of the formula



wherein

(i) A is a straight or branched alkylene group having 1, 2, 3 or 4 carbon atoms or a straight or branched alkenylene group having 2, 3 or 4 carbon atoms and R is a naphthyl, tetrahydronaphthyl, heterocyclyl, arylthio, arylalkylthio, aryloxy, arylalkyloxy, arylhydroxymethylene, arylcarbonyl, arylalkylcarbonyl, alkyloxy, alkylthio, or cycloalkyl or cycloalkenyl group of from 4 to 9 carbon atoms substituted by hydroxy, alkoxy, halo or alkyl.

4,416,896

7-OXABICYCLOPHEPTANE SUBSTITUTED AMINO PROSTAGLANDIN ANALOGS USEFUL IN THE TREATMENT OF THROMBOLYTIC DISEASE

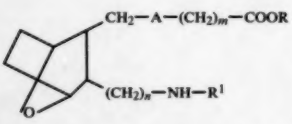
Masami Nakane, Plainsboro, N.J.; David L. Snitman, Boulder, Colo.; Joyce Reid, Dayton, and Martin F. Haslanger, Lambertville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 17, 1982, Ser. No. 378,560

Int. Cl.³ A61K *31/34;* C07D *307/00*

U.S. Cl. 424—285 15 Claims

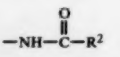
1. A compound having the structural formula



and including all stereoisomers thereof;

wherein A is CH=CH or $(CH_2)_2$;

m is 1 to 8; n is 0 to 5; R is H or lower alkyl; and R^1 is lower alkyl, aryl, aryl-lower alkyl, lower alkoxy, aryl-lower alkoxy or



wherein R^2 is lower alkyl, lower alkoxy, aryl, aryl-lower alkyl, aryloxy, aryl-lower alkoxy, lower alkylamino, arylamino or aryl-lower alkylamino, the term "aryl" when defining an R^1 and/or R^2 substituent or when present as part of an R^1 and/or R^2 substituent may be the same or different and is defined as phenyl, naphthyl, phenyl substituted with lower alkyl, halogen or lower alkoxy, or naphthyl substituted with lower alkyl, halogen or lower alkoxy.

4,416,897

USE OF 8-ANILINO-1-NAPHTHALENESULFONATE IN THE UTERUS TO PREVENT PREGNANCY

Milton J. Cormier, Bogart, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Division of Ser. No. 253,567, Jul. 6, 1981, Pat. No. 4,377,577, which is a continuation-in-part of Ser. No. 155,800, May 30, 1980. This application Jul. 14, 1982, Ser. No. 398,300

Int. Cl.³ A61K *31/185*

U.S. Cl. 424—315 8 Claims

1. A method of preventing pregnancy in a female which comprises introducing an effective amount of the drug 8-anilino-1-naphthalenesulfonate directly into the uterus of the female after sexual intercourse.

4,416,898

THERAPEUTIC USES OF METHIONINE

Gérard R. Le Fur, Plessis Robinson, France, assignor to Pharmuka Laboratoires, Gennevilliers, France

Filed Mar. 1, 1982, Ser. No. 353,469

Int. Cl.³ A61K *31/195*

U.S. Cl. 424—319 3 Claims

1. A method for the treatment of Parkinsonism which comprises orally administering to a patient suffering from Parkinsonism a pharmaceutically effective amount of L-methionine or DL-methionine.

4,416,899

ANTIBIOTIC BMG162-AF2, A PROCESS FOR PRODUCTION THEREOF, AND ANTITUMOR DRUG CONTAINING SAID NEW ANTIBIOTIC AS ACTIVE INGREDIENT

Hamao Umezawa; Tomio Takeuchi; Hiroshi Naganawa; Hironobu Iinuma, and Setsuko Kunimoto, all of Tokyo, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

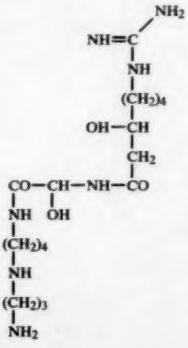
Filed Aug. 28, 1981, Ser. No. 297,458

Claims priority, application Japan, Sep. 8, 1980, 55-123585

Int. Cl.³ A61K *31/16;* C12P *21/00;* C12R *1/07*

U.S. Cl. 424—320 10 Claims

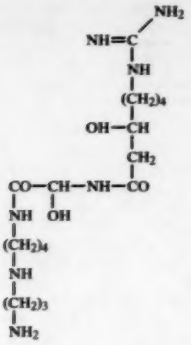
1. A antibiotic BMG162-aF2 having the formula



or a pharmaceutically acceptable salt thereof.

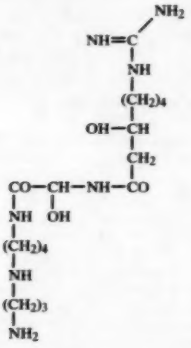
3. A pharmaceutical composition for inhibiting the growth of transplanted tumors sensitive to antibiotic BMG162-aF2

comprising a pharmacologically effective amount of antibiotic BMG162-aF2 having the formula



or a pharmacetically acceptable salt thereof and a pharmaceutically acceptable carrier.

8. A method for inhibiting the growth of a transplanted tumor sensitive to antibiotic BMG162-aF2 in a warm-blooded animal comprising administering to said animal a pharmacologically effective amount of an antibiotic BMG162-aF2 having the formula



or a pharmacetically acceptable salt thereof.

4,416,900

USE OF N-PHENYL-1-NAPHTHYLAMINE IN THE UTERUS TO PREVENT PREGNANCY

Milton J. Cormier, Bogart, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Division of Ser. No. 253,567, Jul. 6, 1981, Pat. No. 4,377,577, which is a continuation-in-part of Ser. No. 155,800, May 30, 1980. This application Jul. 14, 1982, Ser. No. 398,299

Int. Cl.³ A61K *31/135*

U.S. Cl. 424—330 **8 Claims**

1. A method of preventing pregnancy in a female which comprises introducing an effective amount of the drug N-phenyl-1-naphthylamine directly into the uterus of the female after sexual intercourse.

4,416,901

PROCESS FOR PROLONGING THE SHELF LIFE OF COSMETICS

Margarete Bochskandl, New York, N.Y., assignor to American Frometics, Inc., New York, N.Y.

Filed Nov. 30, 1981, Ser. No. 325,945

Int. Cl.³ A61K *47/00, 35/78*

U.S. Cl. 424—363 **11 Claims**

1. A process for prolonging the shelf-life and the period of resistance to micro-organisms of cosmetics comprising:

(a) subjecting said cosmetic to pasteurization while under vacuum or inert gas atmosphere by heating to a temperature of from about 60° C. to about 75° C. and

(b) deep freezing said pasteurized cosmetic to a temperature of below about −100° C.

4,416,902

FLAVORING WITH CYCLOHEXENYL-BETA-METHYL ACROLEIN DERIVATIVES

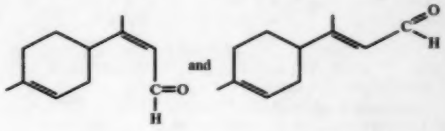
Braja D. Mookherjee, Holmdel; Richard A. Wilson, Westfield; Manfred H. Vock, Locust, and Michael J. Zampino, North Bergen, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jul. 16, 1982, Ser. No. 399,012

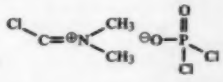
Int. Cl.³ A23L *1/226*

U.S. Cl. 426—3 **2 Claims**

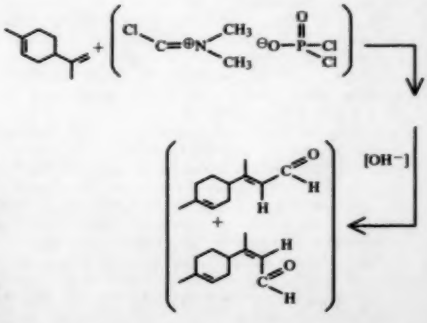
1. A process for augmenting or enchancing the aroma or taste of a consumable material selected from the group consisting of foodstuffs and chewing gums comprising the step of adding to said consumable material from 0.2 ppm up to about 100 ppm based on total composition of a mixture of isomers in the ratio of 50:50 defined according to the structures:



prepared by reacting the salt having the structure:

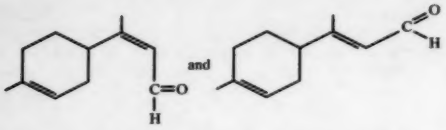


with limonene to form a complex and reacting the resulting complex with aqueous base in accordance with the reaction sequence:

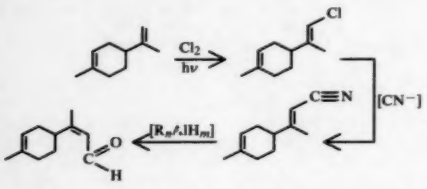


2. A process for augmenting or enhancing the aroma or taste

of a consumable material selected from the group consisting of foodstuffs and chewing gums comprising the step of adding to said consumable material from 0.5 ppm up to about 100 ppm of a mixture of isomers in the ratio of 1:40 having the structures:



produced according to the process of first reacting limonene with chlorine in the presence of light to form limonene chloride; then reacting the limonene chloride with a nitrile to form a limonene nitrile; then reacting the limonene nitrile with a lower alkyl aluminum hydride according to the reaction sequence:



wherein R is lower alkyl, and wherein n is 1 or 2 and m is 1 to 2 and the sum of m+n is 3.

4,416,903

ANTISTALING BAKING COMPOSITION

Morton S. Cole, 2506 Ivy La., Decatur, Ill. 62521

Continuation-in-part of Ser. No. 862,653, Dec. 20, 1977, Pat. No. 4,320,151, which is a continuation-in-part of Ser. No. 693,356, Jun. 7, 1976, abandoned. This application Mar. 8, 1982, Ser. No. 355,908

The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

Int. Cl.³ A21D *2/08*

U.S. Cl. 426—18 **5 Claims**

1. A process of making a bakery product having improved softness retention over an extended shelf life period resulting from an incorporation of a combination of a fungal alpha amylase preparation which is resistent to temperatures incurred during baking and an edible emulsifier, said process comprising the steps of:

a. mixing a dough containing an edible emulsifier taken from the group consisting of mono- or diglycerides, diacetyl tartaric acid esters of mono- and diglycerides, propylene glycol esters of mono- and diglycerides, ethoxylated monoglycerides, succinylated monoglycerides, polysorbate 60, calcium stearoyl-2-lactylate, sodium stearoyl-2-lactylate, lactylic esters of fatty acids, lecithin and mixtures of two or more of the above;

b. preparing a fungal alpha amylase enzyme stabilized against thermal denaturation by dispersion in a concentrated aqueous solution of essentially mono- and disaccharides taken from the group consisting of dextrose, fructose, sucrose, invert syrup, corn syrups, high fructose corn syrup and mixtures of two or more of the above; said mono- and disaccharides being present in a concentration of between 50% and 80% based on the weight of the solution; said solution containing fungal alpha amylase enzyme in intimate solution with the mono- and disaccharides to provide between 10 and 5000 SKB units of fungal alpha amylase activity per 100 g. of flour in a bakery formulation, said dispersion enabling fungal alpha amylase enzyme activity to be retained in the temperature range of 170°–180° F. (76°–82° C.); and

c. adding said sugar dispersion of fungal alpha amylase to said formed dough in such manner that the protective enzyme solution remains substantially undiluted during subsequent dough mixing, handling and baking whereby said mono- and disaccharides form a protective medium which continues to protect the enzyme after its incorporation in the dough.

4,416,904

SHELF STABLE PIZZA AND METHOD FOR PREPARING SAME

Edward L. Shannon, Barrington, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed May 11, 1981, Ser. No. 262,191

Int. Cl.³ A21D *8/00, 15/00*

U.S. Cl. 426—19 **7 Claims**

1. A pizza food comprising in combination a baked crust component, a tomato based sauce component and a cheese topping component, each of the said components possessing shelf stability at ambient temperature;

(a) said baked crust component containing flour, yeast, fat, an anti-mycotic agent and an edible acid in an amount sufficient to afford a crust having a pH of not more than about 5.0,

(b) said tomato based sauce component having a pH not above about 4.6 and containing at least 5% of natural tomato soluble solids and an amount of an edible anti-mycotic sufficient to retard microbial growth, and

(c) said cheese component having a pH not above about 5.5 and containing an edible anti-mycotic in an amount sufficient to retard microbial growth.

4,416,905

METHOD OF PREPARING CULTURED DAIRY PRODUCTS

Erik Lundstedt, Boca Raton, Fla., and Edgar A. Corbin, Jr., Manchester, Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Aug. 24, 1981, Ser. No. 295,583

Int. Cl.³ A23C *9/12*

U.S. Cl. 426—34 **28 Claims**

1. A method for the production of a cultured dairy product from a liquid dairy medium comprising adding a starter culture at a concentration of about 4–6% by weight of the liquid dairy medium and fermenting said medium at a temperature of about 80°–90° F. to reduce the pH of the medium to a range of from about 5.2 to about 6.2 and to develop desirable flavors and aromas, and, prior to the development of off-tastes, cooling the medium to a fermentation rate-reducing temperature, and acidulating the medium with a food grade acid to a pH of 4.7 or below to produce a cultured dairy product.

4,416,906

MICROWAVE FOOD HEATING CONTAINER

James D. Watkins, Golden Valley, Minn., assignor to Golden Valley Foods Inc., Eden Prairie, Minn.

Continuation of Ser. No. 33,972, Apr. 27, 1979, abandoned. This application Jul. 13, 1981, Ser. No. 283,145

Int. Cl.³ B65D *81/34*

U.S. Cl. 426—107 **5 Claims**

1. A package of cold food heatable with an improved uniformity of temperature in a conventional microwave oven directly from a refrigerated or frozen condition, said package of cold food comprising:

a sealed package including a disposable container comprising two main wall members, including one wall member comprising a cover formed from sheet material and another wall member comprising a dish body having a bottom wall and an internally rib-free, upwardly-directed peripheral sidewall at the outer periphery of said bottom

wall with an upper edge defining an upwardly-open wide mouth;

said cover being secured to said sidewall so as to close said mouth and provide a sealed cavity within said container;

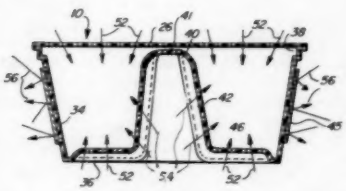
said dish body bottom wall having a centrally-disposed, upwardly-extending, upwardly-tapering hollow core positioned thereon and projecting vertically within said container;

said core comprising a finger-shaped member extending between said bottom wall and said cover and having a closed upper end positioned in proximity to said cover;

said core including surface means thereon within said sealed cavity providing a perimetrically-extending wall having a plurality of angularly-neighboring ribs extending longitudinally therealong;

said core being perimetrically surrounded by a body of cold food;

said body of cold food in said sealed cavity containing water in liquid or frozen form, being in the range of about 40° F. and about 0° F. when said package is in said refrigerated or frozen condition, filling said sealed cavity at least to a



substantial depth within which said food is disposed for contact with said ribs of said core and with said rib-free sidewall, and existing as a unitary entity without partitionment into a multiplicity of unconnected entities;

said core wall and cover being substantially transmissive of microwave oven microwave energy for functioning in use as a microwave influx passage for entry of microwave energy into said food within said container;

said core including said ribs thereof being structured and arranged for functioning during microwave heating of said food as a guide means for directing the flow of fluid portions of said food in an upward direction in the vicinity of said core, whereby said core including said ribs thereof contributes to the distribution of heat in said container during microwave heating of said food in said container in a microwave oven by assisting in fluid convection and the absence of ribs on said sidewall within said cavity cooperates with the presence of said ribs on said core to balance microwave heating of said food throughout said cavity and provide more uniform heating of said food than would a similar package having ribs provided on its peripheral sidewall within its cavity.

4,416,907

PROCESS FOR PREPARING FOOD PACKAGES FOR MICROWAVE HEATING

James D. Watkins, Golden Valley, Minn., assignor to Golden Valley Foods Inc., Eden Prairie, Minn.

Division of Ser. No. 283,145, Jul. 13, 1981, which is a continuation of Ser. No. 33,972, Apr. 27, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 430,045

Int. Cl.³ B65B *29/08;* A23L *1/01*

U.S. Cl. 426—234 **7 Claims**

1. A process for preparing a sealable package of liquid-containing food to be heated in a microwave oven comprising,

providing a disposable shipping container including a wall member comprising a dish body having a bottom wall and an internally rib-free, upwardly-directed peripheral sidewall at the outer periphery of said bottom wall with an upper edge defining an upwardly-open wide mouth;

said dish body bottom wall having a centrally-disposed, upwardly-extending, upwardly-tapering hollow core positioned thereon and projecting vertically within said container;

filling the container with a liquid-containing food capable of coupling with microwave energy and sealing the open mouth of the container by securing to said side wall a removable cover formed from sheet material;

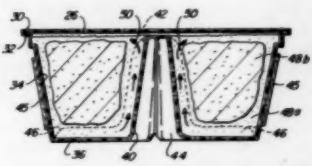
said core comprising a finger-shaped member extending between said bottom wall and said cover and having a closed upper end positioned in proximity to said cover;

said core including surface means thereon within said sealed cavity providing a perimetrically-extending wall having a plurality of angularly-neighboring ribs extending longitudinally therealong;

said core being perimetrically surrounded by said body of food;

chilling the container and the food therein;

said body of chilled food in said sealed cavity containing water in liquid or frozen form, being in the range of about 40° F. and about 0° F., and said body of chilled food filing



said sealed cavity at least to a substantial depth within which said food is disposed for contact with said ribs of said core and with said rib-free sidewall, and existing as a unitary entity without partitionment into a multiplicity of unconnected entities;

said core wall and cover being substantially transmissive of microwave oven microwave energy for functioning in use as a microwave influx passage for entry of microwave energy into said food within said container;

said core including said ribs thereof being structured and arranged for functioning during microwave heating of said food as a guide means for directing the flow of fluid portions of said food in an upward direction in the vicinity of said core, whereby said core including said ribs thereof contributes to the distribution of heat in said container during microwave heating of said food in said container in a microwave over by assisting in fluid convection and the absence of ribs on said sidewall within said cavity cooperates with the presence of said ribs on said core to balance microwave heating of said food throughout said cavity and provide more uniform heating of said food than would a similar package having ribs provided on its peripheral sidewall within its cavity.

4,416,908

INSECT DE-INFESTATION METHOD

Howard F. McKinney, Chesterfield, and Frederick C. Wear, St. Louis, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 167,687, Jul. 11, 1980, abandoned. This application Mar. 18, 1982, Ser. No. 359,521

Int. Cl.³ A23L *3/00;* H05B *6/64*

U.S. Cl. 426—241 **9 Claims**

1. A method of treating products such as grain and packaged foodstuffs containing insects, larvae, and eggs to kill said insects, larvae, and eggs in the products by microwave energy comprising the steps of:

(a) placing the product in an atmosphere of reduced pressure of about 5 to about 85 Torr, and

(b) subjecting the product to microwave energy of about 10^2 MH_z to about 10^4 MH_z frequency and a power density of at least about 4 watts/in^3 of product being treated for a time sufficient to kill any insects and larvae in the product without raising the temperature of the product substantially above 120° F. and without substantially injuring the grain or foodstuff.

4,416,909

MEAT PRESERVATION METHOD

Ralph W. Aversano, 598 Benham St., Hamden, Conn. 06514

Filed May 10, 1982, Ser. No. 376,414

Int. Cl.³ A23B *4/02, 4/12*

U.S. Cl. 426—265 **7 Claims**

1. A method for treating edible meat and meat products to maintain the desirable meat color thereof and to maintain freshness which comprises applying to said meat, from ¼ ounce to 2 pounds per hundred pounds of meat, a composition consisting essentially of from 10 to 40% of each of the following components:

(a) a material selected from the group consisting of ascorbic acid, the sodium and potassium salts thereof and mixtures thereof;

(b) a material selected from the group consisting of citric acid, the sodium and potassium salts thereof and mixtures thereof;

(c) a material selected from the group consisting of sodium carbonate, potassium carbonate and mixtures thereof; and

(d) a material selected from the group consisting of sodium and potassium sulfite, bisulfite and metabisulfite and mixtures thereof.

4,416,910

METHOD OF CONTINUOUSLY MANUFACTURING MULTI-LAYERED DOUGH MATERIALS

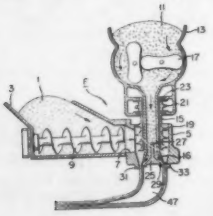
Torahiko Hayashi, 3-4,, Nozawa-machi Utsunomiya-shi Tochigi-ken; Minoru Kageyama, 48-1, Kamitomatsuri-cho, Utsunomiya-shi, Tochigi-ken, and Michio Morikawa, 67, 1-chome, Yossi-cho, Utsunomiya-shi, Tochigi-ken, all of Japan

Division of Ser. No. 937,967, Aug. 30, 1978, Pat. No. 4,266,920, which is a division of Ser. No. 665,326, Mar. 9, 1976, Pat. No. 4,113,819. This application Sep. 2, 1980, Ser. No. 183,422

Claims priority, application Japan, Mar. 10, 1975, 50-29355

Int. Cl.³ A21D *6/00*; A23P *1/00*

U.S. Cl. 426—502 **1 Claim**



1. A method of continuously manufacturing a strip of layered food material, comprising the steps of feeding continuously a plurality of food materials in the form of a hollow tube consisting of concentric layers of said food materials, transferring said hollow tube onto a continuously driven conveyor and collapsing said tube flat by its own weight on said conveyor, the outer layer of said food material being formed of a dough material and another food material forming an inner layer.

4,416,911

GAS SENSOR ELEMENTS AND METHODS OF MANUFACTURING THEM

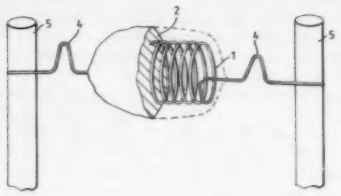
Gordon S. Wilkinson-Tough, Leeds, England, assignor to International Gas Detectors Limited, Wetherby, England

Filed Dec. 30, 1980, Ser. No. 221,272

Claims priority, application United Kingdom, Jan. 2, 1980, 8000040

Int. Cl.³ G01N *27/16*

U.S. Cl. 427—12 **11 Claims**



1. A method of making a gas sensor element comprising the steps of:

providing an electrical resistance filament;

preparing a slurry from a mixture of alumina and at least one catalyst precursor in a substantially non-aqueous organic liquid, the mean particle size in the slurry being less than 20 nm;

depositing said slurry on said electrical resistance filament; and,

removing said non-aqueous organic liquid and decomposing said at least one catalyst precursor whereby said filament is surrounded by a bead which includes an array of said alumina particles interspersed between and bound together only by particles of a catalyst for inducing catalytic oxidation of flammable gases to form an open porous gas diffusive skeletal matrix having a mean particle size of less than 20 nm.

4,416,912

FORMATION OF COATINGS ON CUTTING EDGES

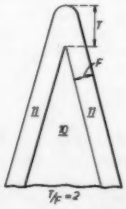
Roger J. Bache, Reading, England, assignor to The Gillette Company, Boston, Mass.

Filed Oct. 15, 1980, Ser. No. 197,351

Claims priority, application United Kingdom, Oct. 13, 1979, 7935706

Int. Cl.³ B05D *1/04*

U.S. Cl. 427—13 **6 Claims**

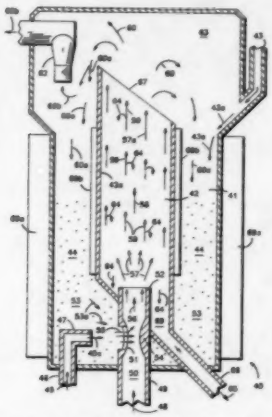


1. In a process for the formation of metal and metal compound coatings on cutting edges by chemical vapor deposition in a deposition chamber, the improvement wherein a static electric field is established between the cutting edge and a counter electrode positioned in the deposition chamber, the field potential and gas pressure being such that glow discharge does not take place and the field potential additionally being such that a dense adherent coating is obtained.

4,416,913
ASCENDING DIFFERENTIAL SILICON HARVESTING MEANS AND METHOD

William M. Ingle; Robert D. Darnell, both of Phoenix, Ariz., and Stephen W. Thompson, Rosenberg, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1982, Ser. No. 425,832
Int. Cl.³ C23C 11/00
U.S. Cl. 427—45.1 19 Claims



1. A recirculating reactor system for reacting seed particles with a source gas, comprising:

a reservoir for receiving said seed particles and having an input and output;

a reactor having an input and an output coupled to said reservoir, adapted to permit lifting and transport of particles of less than a first predetermined size which is larger than said seed particles, from said reactor input to said reactor output;

first mixing means coupled to said output of said reservoir for receiving seed particles from said reservoir and for forming a first gas-particle mixture with an input non-source gas;

second mixing means coupled to said input of said reactor for receiving said first gas-particle mixture and for forming a second gas-particle mixture by combining said first gas-particle mixture with a gas comprising said source gas while preventing feedback leakage of said source gas into said reservoir, and wherein said second gas-particle mixture is delivered to said input of said reactor;

lifting gas inlet means coupled to said first mixing means, said second mixing means, or both mixing means for supplying a lifting gas of a velocity sufficient to produce, within said reactor, said lifting and transport of said particles of less than said first predetermined size;

separator means coupled to said output of said reactor and said input of said reservoir for separating spent gas and transported particles ejected from said reactor and returning said ejected particles to said reservoir to be reused as seed particles;

harvesting means coupled to said reactor for harvesting non-ejected particles which have remained in said reactor;

gas extraction means coupled to said separator means for receiving spent gas from said separator means;

seed particle injection means coupled to said reservoir for injecting new seed particles into said reservoir; and

heating means for providing heat to said reactor to promote reaction between said seed particles and said source gas.

12. A process for coating particles with a material reacted at least partially from a source gas, comprising:

introducing seed particles of less than a first predetermined size into a reservoir coupled to a reaction chamber;

introducing into said reservoir a first gas, wherein said first gas is a non-source gas;

agitating said seed particles in said reservoir by means of said first gas;

mixing said first gas and a portion of said seed particles to form a first gas-particle mixture;

injecting said first gas-particle mixture into a stream of a gas which comprises said source gas, to form a second gas-particle mixture, without substantial feedback of said source gas into said reservoir;

flowing said second gas-particle mixture through said reaction chamber so as to have a first predetermined gas velocity in said reaction chamber;

regulating said first predetermined gas velocity in said reaction chamber so that particles less than a second predetermined size greater than said first predetermined size are substantially carried through said reaction chamber toward an outlet end;

heating said second gas-particle mixture in said reaction chamber to react said source gas so as to coat said particles with said material, thereby producing larger particles and spent gases;

collecting in said reaction chamber said coated particles whose size is greater than said second predetermined size;

ejecting from said outlet end of said reaction chamber said spent gases and said coated particles whose size is less than said second predetermined size;

decelerating said ejected gases to reduce their velocity and separate said ejected particles from said spent gases;

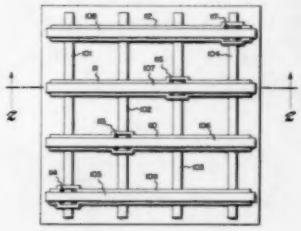
collecting said ejected particles in said reservoir to provide seed particles for subsequent reactions; and

harvesting said collected particles by extracting said collected particles from said reaction chamber.

4,416,914
ELECTRICAL CONDUCTORS ARRANGED IN MULTIPLE LAYERS AND PREPARATION THEREOF

Charles W. Eichelberger, Schenectady, and Robert J. Wojnarowski, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,341
Int. Cl.³ H05K 3/18, 3/46
U.S. Cl. 427—54.1 20 Claims



1. A method of forming an electrical conductor pattern on a substrate, comprising the steps of:

providing a design of a first metal conductor on said substrate;

forming a contiguous layer of another metal on the first conductor;

then applying a dielectric material to selected areas of both said substrate and the contiguous layer on said first conductor;

applying a desired design to the substrate with a first ink composition comprising a metallic powder of finely divided second metal and a first polymer, with said first ink composition contacting said dielectric material and also

contacting the contiguous layer on said first conductor at an area thereof unprotected by said dielectric material; and

contacting said first ink composition with a first solution containing a salt of a third metal, said third metal being more noble than both said second metal and said another metal to cause the anion of said salt to form soluble salts with each of said second and another metals to cause a contiguous layer of said third metal to be formed on said ink composition and a contiguous layer of said third metal to be formed on adjacent portions of said first conductor layer at the unprotected areas thereof.

4,416,915

METHOD OF MAKING CHALCOGENIDE CATHODES

David N. Palmer, Tolland, and Gary W. Ferrell, Collinsville, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 4, 1982, Ser. No. 345,605
Int. Cl.³ B05D 5/12
U.S. Cl. 427—126.3 4 Claims

1. A method of making a chalcogenide cathode which comprises:

(a) forming a mixture containing at least one intercalatable layered transition metal chalcogenide cathode active material, a conductivity enhancing agent and a binding agent;

(b) forming a slurry containing the mixture and a vehicle therefor;

(c) treating a high porosity current collector substrate by applying an adhesion promoting agent thereon and drying the treated substrate;

(d) applying the slurry to the treated and dried substrate; and

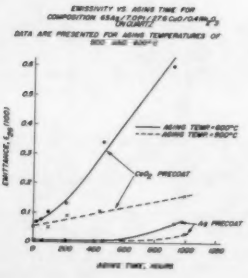
(e) heating the substrate in an inert atmosphere to drive off the vehicle and coalesce the binding agent.

4,416,916

THIN FILM SOLAR ENERGY COLLECTOR

Kamran Aykan, Monmouth Beach; Robert J. Farrauto, Westfield; Clinton F. Jefferson, Millburn, and Richard D. Lanam, Westfield, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Mar. 4, 1982, Ser. No. 354,831
Int. Cl.³ B05D 1/38; B32B 17/06, 15/18, 15/04
U.S. Cl. 427—160 23 Claims



20. A method for preparing a solar energy collector of improved thermal stability, which comprises:

(A) uniformly depositing a thin silver-, or silver/platinum-interlayer onto a substrate selected from the group consisting of quartz, silicate glass, and stainless steel;

(B) drying and calcining the coated substrate, at a temperature up to about 800° C.;

(C) uniformly depositing silver, copper oxide, rhodium/-rhodium oxide and 0–15% platinum onto the surface of the silver- or silver/platinum-coated substrate; and

(D) drying and calcining the coated substrate, to obtain the desired collector.

4,416,917

COATING SUBSTRATES WITH HIGH SOLIDS COMPOSITIONS

Haywood G. France, South Charleston, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 30, 1981, Ser. No. 230,297
Int. Cl.³ B05D 3/10
U.S. Cl. 427—302 10 Claims

1. In the method of fabricating cured epoxy-coated substrates employing a two-package technique wherein an epoxy resin composition and catalyst are stored separately until use and mixed soon before application to said substrates, the improvement which comprises first treating said substrates by adhering thereto a curing amount of a sulfonic acid salt having the formula:

$$M(R_xSO_3)_y$$

wherein R_x is a fluoroalkyl having 1 to about 18 carbons, M is selected from the group consisting of ammonium (NH_4^+) cation, quaternary ammonium cations, cations of protonated amines, a mono- or polyvalent cation of a metal selected from the group consisting of metals of Groups I to V inclusive and VIII and subgroups VIB and VIIB of the Periodic Table and y is an integer equal to the valence of M, thereafter applying an aliphatic or cycloaliphatic liquid epoxy high solids resin composition, containing sufficient amounts of monofunctional carboxylic acids or sufficient amounts of polyols to provide an epoxy/carboxy or epoxy/hydroxy ratio respectively of from about 0.5 to about 5, to said treated substrates and heating the resultant composite at a temperature of about 50° to about 200° C. until a cured resin coating is obtained.

4,416,918

Patent Not Issued For This Number

4,416,919

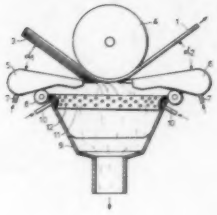
METHOD AND AN APPARATUS FOR REMOVING THICKENINGS IN COATINGS OCCURRING TRANSVERSELY TO THE DIRECTION OF TRAVEL OF THE WEB

Wilfried Beck, Cologne, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed May 13, 1981, Ser. No. 263,282
Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019459
Int. Cl.³ B05C 11/06
U.S. Cl. 427—296 9 Claims

8. A method for removing thickenings in layers which are produced transversely to the direction of travel of the web on

the web during the coating of photographic film and paper webs with photographic emulsions and layers, characterised in that the coated web is deflected by a web guide element and two air blades and air jets pointing towards each other are directed at a small angle α towards the layer of the web from below at the deflecting point which are actuated when thickenings appear in the layer and which scrape off the particles of the thickening in the layer and blow them into a vacuum tank which is sprinkled all over with water and which receives the particles, and the mixture of air, water and particles is supplied to a vacuum generating device which, in turn, is evacuated continuously by a jet suction device without interrupting the vacuum.



4,416,920

LOW TIN TERNE COATING

Marvin B. Pierson, Franklin, and Frank C. Dunbar, Monroe, both of Ohio, assignors to Armco Inc., Middletown, Ohio

Division of Ser. No. 118,073, Feb. 4, 1980, Pat. No. 4,315,056, which is a continuation of Ser. No. 793,624, May 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 730,622, Oct. 7, 1976, abandoned, which is a continuation of Ser. No. 490,917, Jul. 22, 1974, abandoned. This application Aug. 17, 1981, Ser. No. 293,365

Int. Cl.³ B23B *15/04*

U.S. Cl. 427—349 **3 Claims**

1. The method of producing a low-tin terne coated steel article, the weight of the coating being about 0.05 oz./ft.^{2} (15.2 g./m.^{2}), through the entire range of commercial coating weights and being the only metallic coating on said article, which includes the steps of passing the article through a bath consisting essentially of from about 2% tin to about 6.5% tin and the balance lead, with no other purposeful additions, and including only impurities normally present, in an amount less than 1%, and immediately upon its issuance from said bath subjecting it to a jet finishing operation.

4,416,921

COMPOSITION AND PROCESS FOR THE IMPREGNATION AND SEALING OF POROUS ARTICLES

David J. Dunn, Twinsburg, Ohio, assignor to Loctite (Ireland) Limited, Dublin, Ireland

Continuation of Ser. No. 112,777, Jan. 17, 1980, abandoned. This application Jul. 17, 1981, Ser. No. 284,284

Int. Cl.³ B05D *3/12, 3/02;* **C08F** *22/26*

U.S. Cl. 427—353 **6 Claims**

1. A composition of matter which is useful in a process for impregnating and sealing of porous articles, the composition comprising:

(a) an azonitrile;

(b) a polymerizable acrylic monomer;

(c) a substituted, sterically-hindered phenol; and

(d) a metal ion chelator.

5. A method for impregnating and sealing a porous article which comprises the steps of:

(a) impregnating said article with the composition of claim 1; and

(b) curing said composition while in said porous article.

4,416,922

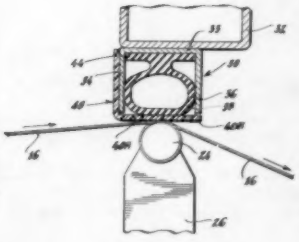
APPARATUS AND METHOD FOR METERING A COATING APPLIED TO A MOVING WEB

Robert M. Fridhandler, Blauvelt, N.Y., assignor to St. Regis Paper Company, West Nyack, N.Y.

Filed Sep. 24, 1982, Ser. No. 423,463

Int. Cl.³ B05C *11/02*

U.S. Cl. 427—361 **7 Claims**



6. A method for metering and smoothing a coating on the coated side of a moving web of material comprising:

feeding the web between a skirt of flexible sheet material and a rod for metering and smoothing the coating, the rod being disposed in rolling contact with the coating, the skirt extending across the web and having a portion extending in contact with and in the direction of movement of the uncoated side of the web, and

creating a constant pressure web coating region across the web between the web and the rod by inflating an expansible tube along said skirt portion to cause said skirt portion to bear on the uncoated side of the web and on the rod to provide a layer of skimmed coating on the web of substantially uniform thickness.

4,416,923

METHOD OF MANUFACTURING POLYESTER FIBERS WITH GOOD ADHESIVENESS TO RUBBER USING AMINOSILANES AND EPOXY COMPOUNDS IN A YARN FINISH

Shigemitsu Murase, Joyo, Japan, assignor to Unitika Ltd., Hyogo, Japan

Filed Sep. 13, 1982, Ser. No. 416,820
Claims priority, application Japan, Feb. 15, 1982, 57-23436
Int. Cl.³ B05D 3/02
U.S. Cl. 427—387 17 Claims

1. A method of manufacturing polyester fibers with good adhesiveness to rubber comprising, in the process of making polyester fiber into yarn, yarn-making oil (spin finish) containing an epoxy compound and an alkylene oxide adduct of an amine compound containing an alkoxysilane group is added to the polyester fiber, and then heat-treating the yarn.

4,416,924

POLYCARBONATE SIZING FINISH AND METHOD OF APPLICATION THEREOF

Howell L. Peterson, New Providence, and Paul E. McMahon, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Sep. 23, 1982, Ser. No. 422,105
Int. Cl.³ B05D 7/26
U.S. Cl. 427—388.1 10 Claims

1. In a method of applying a polycarbonate finish to a fiber whereby said fiber is contacted with a sizing composition comprising a polycarbonate dissolved in a solvent, said solvent subsequently being removed from said fiber, the improvement wherein said solvent comprises a major amount of N-methyl-2-pyrrolidone and a minor amount of an alcohol having from 1 to 4 carbon atoms.

4,416,925

VARNISH AND A METHOD OF COATING PLASTIC WITH POLYVINYLIDENE FLUORIDE

Werner Goll, Hart, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengeselischaft, Trostberg, Fed. Rep. of Germany

Continuation of Ser. No. 110,583, Jan. 9, 1980, abandoned. This application Aug. 24, 1981, Ser. No. 295,936
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1979, 2902095
Int. Cl.³ B05D 3/02
U.S. Cl. 427—393.5 20 Claims

8. In a method of coating plastics with polyvinylidene fluoride, the steps of dispersing 20 to 60 wt % finely divided polyvinylidene fluoride in

(a) 25 to 65 wt-% of at least one high-boiling, organic solvent having a boiling point from about 125° C. to about 250° C., which dissolves polyvinylidene fluoride slightly or not at all, and

(b) 5 to 30 wt-% of at least one strongly polar latent organic solvent for polyvinylidene fluoride, and thereafter dissolving the dispersion obtained

(c) in 60 to 90 wt-% of at least one low-boiling polar organic solvent having a boiling point up to 126° C.,

coating the plastic surface with the solution and

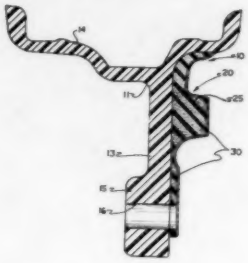
baking the coating on the surface at a temperature of 100° to 300° C.

4,416,926

STYLIZED SURFACE FINISHES

Ralph A. Maglio, Wadsworth, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 126,614, Mar. 3, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,142
Int. Cl.³ B60R 13/00
U.S. Cl. 428—31 10 Claims



1. A stylized article, comprising:

a metal or plastic base material; said base material being a vehicle wheel,

a resin residing on said base material;

said resin containing a plurality of hollow spheres to form a syntactic foam, the specific gravity of said syntactic foam ranging from about 0.3 grams per cc to about 1.0 grams per cc; and

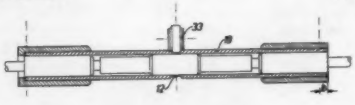
a stylized surface element, said stylized surface element residing on said syntactic foam and forming the stylized article.

4,416,927

TUBULAR ARTICLE OF POLYETHYLENE TEREPHTHALATE HAVING A WALL OF AMORPHOUS MATERIAL WITH A PERIPHERAL GROOVE THEREIN OF MONOAXIALLY ORIENTED MATERIAL

Claes T. Nilsson, Löddeköpinge; Kjell M. Jakobsen, Skanör, and Las G. Larson, Höör, all of Sweden, assignors to PLM AB, Malmo, Sweden

Filed May 26, 1981, Ser. No. 266,849
Claims priority, application Sweden, May 29, 1980, 8004003
Int. Cl.³ F16L 11/06
U.S. Cl. 428—36 7 Claims

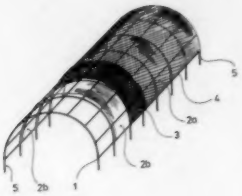


1. A tubular articlemade of polyethylene therephtalate or similar material, produced from a blank having a wall of a thickness (a) consisting essentially of amorphous material and provided with a peripheral groove in said wall, the material in the bottom of said groove having a thickness (d) corresponding to the thickness of a panel of said amorphous material initially of thickness (a) and drawn monoaxially until it yields at an initial temperature that is lower than the region of the glass transition temperature (TG) of the material.

4,416,928
COVER STRUCTURE

Heinz Carl, D-8644, Pressig, Fed. Rep. of Germany

Filed May 10, 1982, Ser. No. 376,606
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142149; Feb. 16, 1982, 3205383
Int. Cl.³ B32B 3/24; E04C 2/00
U.S. Cl. 428—38 7 Claims



1. A cover structure comprising:

A. a substantially rigid grid-like frame structure comprising two sets of rod-like members, the rod-like members of each set being in spaced apart substantially parallel relation to one another and in crosswise relation to the members of the other set; and

B. a pair of shrinkable plastic sheets, each covering one side of said frame structure and adhered thereto, said sheets

(1) cooperating to substantially enclose the frame structure,

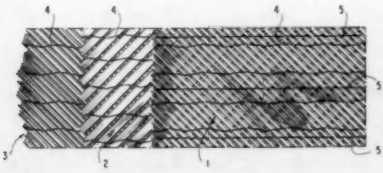
(2) being shrunk to be under edgewise tension between the members of the frame structure, and

(3) being bonded flatwise to one another through the spaces between the members of the frame structure.

4,416,929
MULTILAYER STITCHED KNITTED FIBERGLASS COMPOSITE

Ronald G. Krueger, Seguin, Tex., assignor to Proform, Inc., Minneapolis, Minn.

Filed Jul. 2, 1981, Ser. No. 279,649
Int. Cl.³ B32B 3/06
U.S. Cl. 428—102 9 Claims



1. A structural fabric comprising:

a first layer of substantially parallel, structural fibers, aligned at an angle of 45° to the longitudinal center line of said first layer,

a second layer of substantially parallel, structural fibers, affixed to said first layer, of approximately twice the weight of the fibers of said first layer, wherein said fibers of said second layer are aligned at an angle of 90° to those of the first layer, and

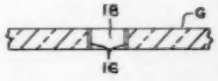
a third layer, affixed to said second layer on the side opposite that to which said first layer is affixed, said third layer being comprised of substantially parallel, structural fibers, of a weight approximately equal to that of the fibers of said first layer, and aligned at an angle of 90° to those of said second layer,

wherein said layers are affixed to each other by secondary yarns or threads stitched therebetween, and wherein the fibers of each layer are maintained in substantially parallel alignment by secondary yarns or threads stitched therebetween.

4,416,930
TREATING GLASS SHEETS TO HEAL VENTS THAT RESULT IN BREAKAGE DURING THERMAL TREATMENT

Joseph B. Kelly, Crestline, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 210,100, Nov. 24, 1980, abandoned, which is a continuation of Ser. No. 971,607, Dec. 20, 1978, abandoned. This application Mar. 31, 1982, Ser. No. 364,144
Int. Cl.³ B32B 17/06, 3/10; C03C 17/02
U.S. Cl. 428—137 10 Claims



1. In the art of heat treating a series of float glass sheets of soda-lime-silica composition having a scored region susceptible to breakage during thermal treatment during which said glass sheets (is) differing in thickness and in stress around the scored region are heated to elevated temperatures differing according to glass sheet thickness within a temperature range above (its) the strain point of float glass and rapidly cooled below (its) said strain point, which thermal treatment is more likely to develop said scored region into a break in those sheets of said series heated to a maximum temperature at the lower end of said temperature range and to cause some sheets in said series that are heated to a higher maximum temperature within said temperature range to tend to lose their shape before said rapid cooling, the improvement consisting of the one step of applying exclusively to the vicinity of said scored region, prior to said thermal treatment, a liquid composition adherent to said scored region, and containing as an essential ingredient sodium silicate, which composition is capable of flowing and healing said scored region and does not decompose into a composition that fails to protect said scored region during said thermal treatment, and subjecting said glass sheet with said composition applied to protect said scored region to said thermal treatment, whereby the frequency of breakage in said scored region is less than that experienced in the absence of said one step of applying said liquid composition and is less than the frequency of breakage experienced by glass sheets attaining equal maximum temperatures at the lower end of said temperature range after either no pretreatment with any composition or after pretreatment with a composition essentially free of sodium silicate.

8. A tempered glass article comprising a sheet of float glass of soda-lime-silica composition having a hole extending entirely through its thickness, said glass sheet having a given viscosity range in the temperature range of thermal treatment required for tempering said glass sheet and a coating bonded to the wall of said hole, said coating consisting essentially of a glassy sodium silicate composition adherent to the wall of said hole and having a lower viscosity than that of said glass sheet throughout said temperature range.

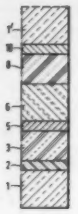
4,416,931
Patent Not Issued For This Number

4,416,932
THICK FILM CONDUCTOR COMPOSITIONS
Kumaran M. Nair, East Amherst, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 289,113, Aug. 3, 1981, Pat. No. 4,381,945. This application Sep. 27, 1982, Ser. No. 425,048
Int. Cl.³ B32B *3/10, 5/16;* B05D *5/12*
U.S. Cl. 428—209 **6 Claims**

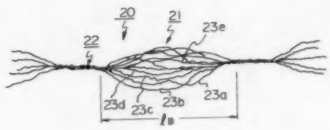
1. A conductive element comprising a nonconductive ceramic substrate having a conductive pattern affixed thereon by
(a) printing thereon a patterned film of a screen-printable paste which is a dispersion in organic medium of a metallization comprising an admixture of finely divided particles of
(1) 30–80% by weight noble metal or alloy thereof,
(2) 1–20% by weight low melting, low viscosity glass,
(3) 0.1–10% by weight inorganic metal oxide capable of reacting with Al_2O_3 under firing conditions to form a spinel structure, and
(4) organotitanate which is a source of positive titanium ions under firing conditions,
(b) drying, and
(c) firing the dried film to effect volatilization of the organic medium and liquid phase sintering of the glass.

4,416,933
THIN FILM ELECTROLUMINESCENCE STRUCTURE
Jorma O. Antson; Sven G. Lindfors, both of Espoo; Arto J. Pakkala, Evitskog; Jarmo I. Skarp, Helsinki; Tuomo S. Suntola, and Markku A. Ylilammi, both of Espoo, all of Finland, assignors to Oy Lohja Ab, Virkkala, Finland
Filed Feb. 8, 1982, Ser. No. 346,872
Claims priority, application Finland, Feb. 23, 1981, 810547
Int. Cl.³ H05B *33/12;* B32B *17/06*
U.S. Cl. 428—216 **6 Claims**

1. A thin film structure including a substrate layer, said structure further comprising:
first and second electrode layers;
a luminescence layer disposed between the first and second electrode layers;
a first chemically protective layer made of an electrically conductive material and disposed between the luminescence layer and the first electrode layer in direct contact with the latter, and having a thickness of the order of about 50 to 1000 nm; and
a second chemically protective and current limiting layer made of a material selected from the group consisting of tantalum-titanium oxide (TTO), barium-titanium oxide ($Ba_xTi_yO_z$), lead-titanium oxide ($PbTiO_3$), and Ta_2O_5 and disposed between and in direct contact with the luminescence layer and the second electrode layer and having a thickness of the order of about 50 to 1000 nm, preferably about 100 to 300 nm.



4,416,934
WOVEN OR KNITTED POLYESTER MULTIFILAMENT FABRIC
Akio Kimura, Ashiya; Osamu Wada, Takatsuki; Shinji Owaki, and Kozo Seimitsu, both of Matsuyama, all of Japan, assignors to Teijin Limited, Osaka, Japan
Filed Mar. 31, 1981, Ser. No. 249,427
Claims priority, application Japan, Apr. 7, 1980, 55-44708
Int. Cl.³ D03D *3/00*
U.S. Cl. 428—224 **13 Claims**



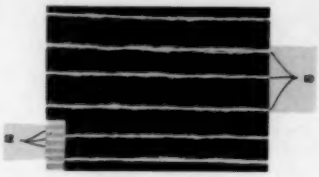
1. A woven or knitted polyester multifilament fabric having a silk like appearance and touch, comprising: polyester multifilament yarns each containing at least one type of porous polyester filaments, each filament having an irregular cross-sectional profile and numerous linear fine concave pores formed on the peripheral surface thereof and extending along the longitudinal axis of each filament, wherein at least 50% of the number of said concave pores has a length of at least 5 microns and a ratio of length to width of the concave pores of at least 5.

4,416,935
BULKED EXTENSIBLE WEFT YARN SUITABLE FOR USE AS TIRE CORDS
Laurence N. Bascom, Amelia, Va., and Peter S. K. Leung, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.
Filed Dec. 11, 1981, Ser. No. 330,003
Int. Cl.³ D02G *3/04, 3/34, 3/48;* D03D *15/08*
U.S. Cl. 428—229 **10 Claims**

1. An extensible bulked yarn consisting essentially of entangled, individually convoluted, undrawn, synthetic, continuous filaments of poly(hexamethylene adipamide) or poly(epsilon-caproamide) and characterized by a multitude of stable crunodal filament loops spaced along its surface and by a break elongation of at least 150%.

9. A woven greige fabric having a weft comprised of (1) an

extensible bulked yarn consisting essentially of entangled, individually convoluted, undrawn, synthetic, continuous filaments of poly(hexamethylene adipamide) or poly(epsilon-



caproamide) which form a multitude of stable crunodal filament loops persistently along the yarn surface and the yarn has a break elongation of at least 150% and (2) a warp comprised of tire cords.

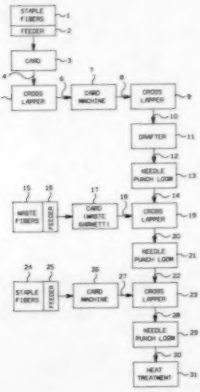
4,416,936
NONWOVEN FABRIC AND METHOD FOR ITS PRODUCTION

Wayne K. Erickson, and Lewis R. Mulligan, both of Seneca, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 170,305, Jul. 18, 1980, abandoned. This application Dec. 28, 1981, Ser. No. 334,507

Int. Cl.³ B32B *27/00*

U.S. Cl. 428—286 **24 Claims**



1. A nonwoven fabric comprising

(a) a first layer formed substantially of synthetic virgin staple fibers;

(b) a second, intermediate layer comprising waste fibers; and

(c) a third layer formed substantially of nonwoven staple fibers, the first, second and third layers being consolidated so as to form an integral, layered fabric.

4,416,937
POLYMER BLENDS AND LAMINATES AND ADHESIVE FILMS PREPARED THEREFROM

Bruce A. Metzger, Newark, Ohio, assignor to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 215,600, Dec. 12, 1980, Pat. No. 4,376,845. This application Mar. 8, 1983, Ser. No. 473,385

Int. Cl.³ B32B *27/00*

U.S. Cl. 428—286 **14 Claims**

1. A consolidated laminar structure comprising at least two dissimilar laminar layers, at least one of said layers being composed essentially of a polymer blend composition comprising, based upon the total weight of said composition,

(a) from about 5 to 90 weight percent of a first adhesive resin having a melt index of from about 50 to about 70 and comprising a random copolymer of a major proportion by weight of ethylene and from about 15 to about 25 weight percent, based upon said copolymer, of an ethylenically unsaturated carboxylic acid;

(b) from about 5 to about 90 weight percent of a normally solid second adhesive resin having a melt index of from about 3 to about 15 and comprising a random copolymer of a major proportion by weight of ethylene with a minor proportion by weight of an ethylenically unsaturated carboxylic acid, a vinyl ester of an alkanoic acid or a lower alkyl or hydroxyalkyl ester of an ethylenically unsaturated carboxylic acid monomer; and

(c) from about 5 to about 70 weight percent of a normally solid non-adhesive resin having a melt index of from about 3 to about 10 and comprising a homopolymer of ethylene or a copolymer of a major proportion by weight of ethylene and a minor proportion by weight of a C_4–C_{12} α-olefin.

4,416,938
INORGANIC FILMS WITH POLY(VINYL ALCOHOL)

Vernon C. Haskell, Circleville, Ohio, assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 301,515, Sep. 14, 1981, Pat. No. 4,376,183. This application Sep. 29, 1982, Ser. No. 427,472

Int. Cl.³ D04H *1/58*

U.S. Cl. 428—289 **6 Claims**

1. A substantially continuous, gas-impermeable film of high barrier quality comprising a homogeneous combination of: (i) 85 to 98 weight percent metal orthophosphate wherein the atom ratio of metal to phosphorous is from 0.5 to 2.3 and the metal is more than 50 atom percent aluminum or iron and less than 50 atom percent tin, titanium, or zirconium; and (ii) 2 to 15 weight percent poly(vinyl alcohol) reacted with a dialdehyde having more than two and less than eight carbon atoms adherent to a shaped article.

4,416,939
HEAT-SENSITIVE RECORDING PAPER

Akira Igarashi, and Sukenori Nakamura, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 13, 1982, Ser. No. 339,231

Claims priority, application Japan, Jan. 13, 1981, 56-3486

Int. Cl.³ B41M *5/18*

U.S. Cl. 428—323 **6 Claims**

1. A heat-sensitive recording paper, comprising:

a base paper wherein a value obtained by drividing a Stöckigt sizing degree determined by JIS-P-8122 by areal weight (g/m^2) determined by JIS-P-8124 is 3×10^{-3} ($S.m^4/g^2$) or more and the base paper having a Bekk smoothness determined by JIS-P-8119 of 90 seconds or more; and

an aqueous heat-sensitive developable layer coated on a surface of said base paper.

4,416,940
SIMULATED WEATHERED-COPPER COATINGS FOR METAL

Kenneth Løye, Lakewood, and Gary Julian, Parma, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Nov. 30, 1981, Ser. No. 325,653

Int. Cl.³ B32B *5/16, 19/02, 27/20*; B05D *5/06*

U.S. Cl. 428—324 **13 Claims**

1. A two-step process for imparting a simulated weathered-copper appearance to a substrate which comprises first applying an opaque pigmented base coat containing a dominant patina-color-producing colorant to a primed or unprimed

substrate; curing said base coat; applying to the cured base coat a non-opaque top coat containing one or more copper-color-producing additives in an amount sufficient to impart a simulated weathered-copper appearance having both a copper metallic appearance by reflection of incident light from said top coat and a patina appearance by transmissiion of light to and reflection from the base coat; said top coat having sufficient transparency toward incident light to allow perception of the patina color of the base coat and simultaneously sufficient copper-color producing additives to allow the reflection of light from the copper-color-producing additives.

4,416,941

ADDITIVE FOR COATING COMPOSITIONS OF SILICA AND A FLUORINATED ETHYLENE OXIDE POLYMER

Robert J. Barsotti, Franklinville, N.J., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jul. 30, 1982, Ser. No. 403,307
Int. Cl.³ C08K *3/08, 3/36;* **C08G** *12/32;* **B32B** *27/42*
U.S. Cl. 428—328 **15 Claims**

1. A coating composition comprising about 40–70% by weight of a binder of film forming constituents and about 30–60% by weight of a nonaqueous liquid carrier, wherein the binder comprises a film-forming acrylic polymer containing polymerized alkyl methacrylate and alkyl acrylate monomers and having reactive carboxyl groups, hydroxyl groups, amide groups, glycidyl groups or a mixture of any of these groups and an alkylated melamine formaldehyde crosslinking agent; and in addition the composition contains about 0.1–10% by weight, based on the weight of the binder, of a rheology control additive consisting essentially of about

(1) 70–98% by weight, based on the weight of the rheology control additive, of colloidal hydrophilic fumed silica having a surface area of about 100–500 square meters per gram and a particle size of about 5–20 millimicrons and

(2) 2–30% by weight, based on the weight of the rheology control additive, of a nonionic fluorocarbon polymer having ethylene oxide linkages and a weight average molecular weight of about 5,000–50,000 and containing about 2–25% by weight, based on the weight of the fluorocarbon polymer, of fluorine.

4,416,942

LAMINATES OF LAMELLAR ARTICLES AND POLYOLEFINS

Robert C. DiLuccio, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed May 21, 1982, Ser. No. 380,769
Int. Cl.³ B32B *27/08;* **C08L** *23/00*
U.S. Cl. 428—332 **12 Claims**

1. An at least two layer laminate comprising:

(a) a layer of a polymer comprising a base polyolefin, a condensation polymer incompatible with the base polyolefin, and an alkylcarboxyl-substituted polyolefin wherein the base polyolefin and the condensation polymer are present in the article as thin, substantially two-dimensional, parallel and overlapping layers of material and the alkyl-carboxyl substituted polyolefin is present between the layers and adheres the layers together, and

(b) a layer of a polyolefin or polyolefin copolymer film, said layer comprising 10 to 90 percent of the thickness of the laminate;

said layers being melt bonded together such that the molecular networks of the layers at the lamination cite are adhered together.

4,416,943

MAGNETIC RECORDING MEDIUM

Seitoku Saito, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1981, Ser. No. 286,289
Claims priority, application Japan, Sep. 1, 1980, 55-120969
Int. Cl.³ B32B *15/00*
U.S. Cl. 428—333 **2 Claims**

1. A magnetic recording medium comprising a substrate layer and at least one magnetic layer consisting essentially of cobalt as a main component and zinc or iridium as an additional component wherein the ratio of Co:Ir is 90:10 and Co:Zn is 86:14 of an alloy of a magnetic layer wherein axes of easy magnetization of said components are substantially perpendicular to a surface of said magnetic layer and thickness of said magnetic layer is in a range of 500 Å to 3 μm.

4,416,944

COMPOSITE STRUCTURES

Ashok M. Adur, Rolling Meadows, Ill., assignor to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 363,894, Mar. 31, 1982, Pat. No. 4,394,485.
This application Dec. 23, 1982, Ser. No. 452,872
Int. Cl.³ B32B *27/00*
U.S. Cl. 428—349 **37 Claims**

1. A composite structure comprising:

(A) a substrate, and adhered thereto

(B) a modified polyolefin blend consisting essentially of:

(i) HDPE having a density of about 0.94–0.97 g/cc;

(ii) at least one polypropylene polymer or copolymer;

(iii) LDPE having a density of about 0.91–0.94 g/cc; and

(iv) a polyethylene polymer grafted with at least one grafting monomer polymerizable ethylenically unsaturated carboxylic acid or acid derivative.

4,416,945

MAGNETIC IMBIBER POLYMERS AND METHOD FOR THE PREPARATION THEREOF

Jitka Solc, Midland, and Daniel H. Haigh, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 3, 1982, Ser. No. 345,291
Int. Cl.³ B32B *27/14, 32/00*
U.S. Cl. 428—407 **5 Claims**

1. A magnetic oil imbibing particulate polymer comprising a plurality of oil-swellable oil-insoluble polymer particles having a diameter of from about 1 micron to about 3 millimeters, a plurality of magnetic particles on a surface of the polymer particles, the magnetic particles being about 50 angstroms to about 1 micron in diameter and being 1–20 weight percent of the polymer, with the further limitation that the polymer particles have a swelling index of at least 1.2, wherein the swelling index is determined by immersing a particular polymer to be evaluated in an organic liquid until the polymer has reached equalibrium swelling, and determining the volume per unit weight of the polymer after a period of 30 minutes in the organic liquid; wherein the ratio of the volume per unit weight with organic liquid to the volume per unit weight of the polymer provides the swelling index.

4,416,946

HIGH STABILITY POLARIZER

Lawrence Bolt, Van Nuys, Calif., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Apr. 5, 1982, Ser. No. 365,430
Int. Cl.³ B32B *27/00, 27/08*
U.S. Cl. 428—421 **6 Claims**

1. A polarizing element which comprises a sheet of a stained polyvinyl alcohol film which is adhered on one side thereof to a flexible transparent fluorine containing sheet, said fluorine containing sheet consisting essentially of a material selected from the group consisting of ethylene-chlorotrifluoroethylene,

polytetrafluoroethylene, polyvinylidene fluoride, ethylene tetrafluoroethylene, perfluoro alkoxy materials, fluorinated ethylene propylene, and polychlorotrifluoroethylene.

4,416,947

MAGNETIC RECORDING MEDIUM

Kunlichi Yoda, Saku, and Takehisa Ohkawa, Shimogoshi, both of Japan, assignors to TDK Electronics Co. Ltd., Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 364,053

Claims priority, application Japan, Apr. 1, 1981, 56-47314

Int. Cl.³ G11B *5/70*; H01F *10/02*

U.S. Cl. 428—447 **10 Claims**

1. A magnetic recording medium comprising a base material and a magnetic coating layer thereon, said magnetic coating layer containing a binder, a highly viscous silicone oil having a viscosity of at least 100,000 centistokes and a higher fatty acid ester composed of a higher fatty acid having a melting point of at least 44° C. and a monohydric alcohol containing 3 to 8 carbon atoms, said silicone oil in an amount of 0.2% to 2.0% by weight of said binder and said higher fatty acid ester in an amount of 0.5% to 3.0% by weight of said binder.

4,416,948

MAGNETIC RECORDING MEDIUM

Takehisa Ohkawa, Shimogoshi, and Kunlichi Yoda, Saku, both of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 364,054

Claims priority, application Japan, Apr. 1, 1981, 56-47316

Int. Cl.³ G11B *5/70*; H01F *10/02*

U.S. Cl. 428—447 **10 Claims**

1. A magnetic recording medium comprising a base material and a magnetic coating layer thereon, said magnetic coating layer containing a binder, a highly viscous silicone oil having a viscosity of at least 100,000 centistokes and a higher fatty acid glycerine ester composed of a higher fatty acid having a melting point of at least 44° C. and glycerine, said silicone oil in an amount of 0.2% to 2.0% by weight of said binder and said glycerine ester in an amount of 0.2% to 2.0% by weight of said binder.

4,416,949

COMPOSITE PANEL COMPRISING A METAL FOIL AND A POLYOLEFINE SHEET

Rodolfo Gabellieri, and Rene Bouteille, both of Brussels, Belgium, assignors to Solvay & Cie., Brussels, Belgium

Continuation of Ser. No. 851,281, Nov. 14, 1977, abandoned.

This application Sep. 11, 1981, Ser. No. 301,320

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1977, 76197

Int. Cl.³ B32B *15/08*

U.S. Cl. 428—461 **13 Claims**

1. Composite panel comprising at least one metal foil combined, directly by hot pressing without any adhesive, with at least one polyolefine sheet, the polyolefine sheet comprising from 10 to 90% by weight of cellulose fibres and from 90 to 10% by weight of a polyolefine modified by polar monomer units derived from at least one organic compound containing at least one double bond and at least one carboxyl group, which may be in the form of an anhydride.

4,416,950

TRANSPARENT FIBROUS SHEETS

Peter Muller; Henry Mustacchi, both of Port Washington, and Leonard Kreicas, Syosset, all of N.Y., assignors to Andrews Paper & Chemical Co., Port Washington, N.Y.

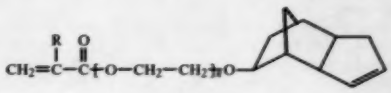
Filed Apr. 29, 1982, Ser. No. 372,953

Int. Cl.³ B32B *23/10*

U.S. Cl. 428—537 **17 Claims**

1. A transparent, non-stratified, water and alcohol resistant, resin reinforced cellulosic fibrous sheet having as the resin component, polymerized monomer of the formula:

(I)



wherein R is selected from the group consisting of hydrogen and lower alkyl and n is an integer of from 0 to 6.

4,416,951

EXTRUDED SEALING STRIP WITH FABRIC COVERED GRIPPING MEANS, PARTICULARLY FOR APPLICATION TO AUTOMOTIVE VEHICLES

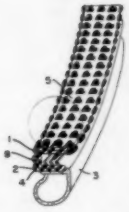
Francois Mesnel, Neuilly-sur-Seine, France, assignor to Etablissements Mesnel, Carrieres-sur-Seine, France

Filed Mar. 16, 1982, Ser. No. 358,612

Claims priority, application France, Mar. 30, 1981, 81 06268; Jul. 7, 1981, 81 13329

Int. Cl.³ B22F *37/00*

U.S. Cl. 428—586 **17 Claims**



1. A sealing strip comprising a deformable body of extruded material; said body having a reinforcement for effecting gripping of said sealing strip to a base, at least part of said body having a covering thereon, said covering including:

a light grade textile material having a loose structure;

a coating of vinyl plastisol on said textile material, said coated textile material being embossed to provide a plurality of raised areas and a plurality of depressed areas between said raised areas, said raised areas being formed by a plurality of cells between said body and said textile material; and

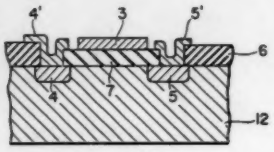
an adhesive between at least said depressed areas and said body, said adhesive bonding only said depressed areas of said textile material to said body, said textile material being unattached to said body in the regions of said raised areas;

whereby said covering of textile material is readily elastically deformable and does not interfere with the deformability of said body of the sealing strip.

4,416,952
OXYNITRIDE FILM AND ITS MANUFACTURING METHOD

Jun-ichi Nishizawa, and Ikuo Shiota, both of Sendai, Japan, assignors to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Division of Ser. No. 215,442, Dec. 11, 1980, Pat. No. 4,331,737, which is a continuation of Ser. No. 23,766, Mar. 26, 1979, abandoned. This application Feb. 24, 1982, Ser. No. 351,618
Claims priority, application Japan, Apr. 1, 1978, 53-38580; Jul. 14, 1978, 53-86573
Int. Cl.³ B32B *15/04*; C01B *21/06*
U.S. Cl. 428—698 **9 Claims**



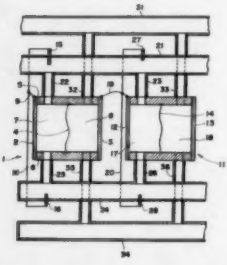
1. An oxynitride film formed of an oxynitride of one substance selected from the group consisting of gallium, aluminum and their mixture, said oxynitride having a finite and non-zero molar ratio of oxygen to nitrogen.

4. An oxynitride film according to claim **1**, in which said film is formed on an underlying substrate.

4,416,953
SECONDARY BATTERY

Takafumi Hashimoto, Asahimachi, and Yukio Kobari, Tokyo, both of Japan, assignors to Meidensha Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1982, Ser. No. 361,818
Int. Cl.³ H01M *8/24*
U.S. Cl. 429—18 **2 Claims**



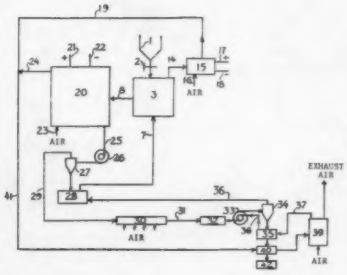
1. In an electrolyte circulation type cell stack secondary battery in which the negatively active material is a metal selected from the group consisting of cadmium, zinc and lead, the improvement wherein an electrode is projected fronting on each of a cathode electrolyte inlet and outlet of each of a plurality of secondary cells, and wherein said electrodes are connected electrically to a cathode of each said secondary cell by connecting means, thereby maintaining said electrodes at the same electric potential as said cathode during the charge and preventing the occurrence of abnormal electrodeposition.

2. In an electrolyte circulating type cell stack secondary battery in which the negatively active material is a metal selected from the group consisting of cadmium, zinc and lead, the improvement wherein each of two cathode electrolyte channels of each of a plurality of secondary cells is connected to an anode electrolyte channel by way of a separator, wherein an electrode is disposed in an area on the anode electrolyte side of each said separator, and wherein said electrodes are connected electrically to a cathode of each said secondary cell and are held at the same electric potential as said cathode, thereby preventing the occurrence of abnormal electrodeposition.

4,416,954
POWER GENERATION APPARATUS

Solomon Zaromb, 171 Clifton Ave., Newark, N.J. 07104

Continuation-in-part of Ser. No. 704,452, Jul. 12, 1976, Pat. No. 4,305,999, Ser. No. 20,967, Mar. 16, 1979, Pat. No. 4,218,520, which is a division of Ser. No. 843,155, Oct. 17, 1977, Pat. No. 4,150,197, and Ser. No. 80,185, Oct. 1, 1979, Pat. No. 4,254,190. This application Aug. 18, 1980, Ser. No. 179,274
The portion of the term of this patent subsequent to Aug. 19, 1997, has been disclaimed.
Int. Cl.³ H01M *8/06*
U.S. Cl. 429—15 **5 Claims**



1. Apparatus for the generation of energy from the oxidation of aluminum or its alloys which comprises:

(a) means for breaking up the continuity of the passivating oxide layer on the aluminum surface by exposing said surface to a mercury-, indium-, or gallium-containing substance;

(b) a reaction chamber wherein the surface-treated aluminum is exposed to a fluid engaging in an oxidation reaction therewith, said fluid comprising a neutral saline, mildly alkaline or mildly acidic electrolyte; and

(c) means for withdrawing useful energy from said oxidation reaction,

wherein said energy-withdrawing means comprises and electrochemical cell, said cell comprises a solid or slurry-type aluminum-containing anode.

4,416,955
FUEL CELL SUB-ASSEMBLY

Chang V. Chi, Brookfield, Conn., assignor to Energy Research Corporation, Danbury, Conn.

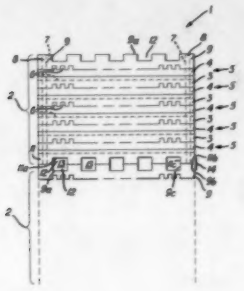
Filed Jan. 11, 1982, Ser. No. 338,354
Int. Cl.³ H01M *8/02*
U.S. Cl. 429—26 **19 Claims**

1. Apparatus comprising:

a first fuel cell assembly including:

a first plurality of fuel cells arranged one adjacent the other;

a first section of a cooling means arranged at an end of said first assembly;



and first means for holding said first fuel cells and said first section together to form a unitary structure.

4,416,956

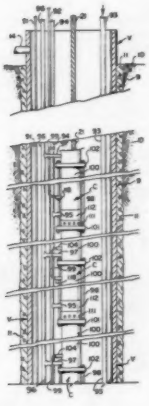
APPARATUS FOR CARRYING OUT A CHEMICAL OR PHYSICAL PROCESS

Harold L. Lawless, P.O. Box 1287, Rapid City, S. Dak. 57701

Continuation of Ser. No. 182,110, Sep. 20, 1971, and a division of Ser. No. 658,511, Aug. 4, 1967, Pat. No. 3,606,999. This application May 27, 1975, Ser. No. 580,697

Int. Cl.[2] H01M *8/02, 8/04*

U.S. Cl. 429—15 **15 Claims**



1. Fuel cell apparatus comprising:

an enclosed space;

a first hollow electrode enclosure disposed in said space, said first enclosure being open at both ends, being electrically conductive and containing non-consumable, electrically conductive pellets;

screen means for retaining said pellets in said first enclosure;

means for supplying water or a fluid electrolyte to one open end of said first enclosure;

means for supplying an oxygen containing gas to the said open end of said first enclosure;

a second hollow electrode enclosure open at both ends and spaced from said first enclosure in said space, said second enclosure being electricly conductive and containing electrically conductive pellets;

screen means for retaining said pellets in said second enclosure;

means for supplying a fuel to the region between the two electrodes to move inside said second enclosure, whereby ions produced in said first enclosure react with the fuel and release electrons from the ions to said electrically conductive pellets and enclosure;

flow of said electrolyte sequentially and axially through said enclosures transports ions from the first electrode to the second electrode; and

electrical connections for an external path for flow of said electrons from said second enclosure to said first enclosure.

4,416,957

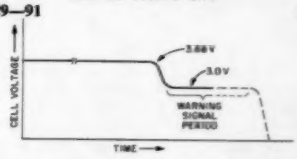
ELECTROCHEMICAL CELL

Franz Goebel, Sudbury, and Robert C. McDonald, Stow, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 3, 1982, Ser. No. 354,276

Int. Cl.[3] H01M *6/14*

U.S. Cl. 429—91 **12 Claims**



1. An electrochemical cell comprising:

a housing;

an electrochemical system within the housing and including an electrolytic solution and a battery stack exposed to said electrolytic solution, said battery stack comprising:

a cathode; and

an anode structure spaced from the cathode and the housing, said anode structure comprising:

a first active element of a first material having a first oxidation potential within the cell, said first active element being consumed by electrochemical action within the cell during discharge of the cell and establishing a first value of operating voltage for the cell during discharge of the cell and the consumption of the first active element; and

a second active element of a second material having a second oxidation potential within the cell, said second active element being consumed by electrochemical action within the cell during discharge of the cell and establishing a second, different value of operating voltage for the cell during discharge of the cell and the consumption of the second active element;

said first and second active elements being arranged with respect to each other so that one of the active elements is consumed before the other whereby the value of operating voltage of the cell changes from one of its two values to the other of its two values;

wherein:

the electrolytic solution includes a catalytically-reducible soluble cathode;

the cathode of the battery stack is a porous carbon structure adjacent to an interior wall of the housing and operative during discharge of the cell to catalytically reduce the soluble cathode of the electrolytic solution; and

the first active element is of a material having a greater oxidation potential within the cell than that of the second active element and surrounds the second active element.

4,416,958

THERMAL BATTERY CELLS UTILIZING $AgNO_3$ IN $LiClO_4$-$LiNO_3$ MIXTURES

Melvin H. Miles, and Aaron N. Fletcher, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 1, 1982, Ser. No. 383,862

Int. Cl.³ H01M *6/20, 6/36*

U.S. Cl. 429—103 **8 Claims**

1. A thermally activated electrochemical cell including:

a cathode composed of metallic nickel, where reduction occurs,

an anode composed of metallic calcium, where oxidation occurs, and

an electrolyte which is disposed between said cathode and said anode, is an electrically non-conductive solid at ambient temperatures, and is capable of becoming an ionically conductive liquid upon being heated above its melting point, said electrolyte comprising an electrolyte layer comprising a mixture of $LiClO_4$ and $LiNO_3$ adjacent to said anode, and an electrolyte layer comprising a mixture of $LiClO_4$, $LiNO_3$, and $AgNO_3$ adjacent said cathode and acting as the oxidizer.

4,416,959

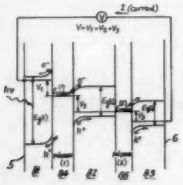
PHOTOELECTROCHEMICAL CELLS FOR CONVERSION OF SOLAR ENERGY TO ELECTRICITY

Terje Skotheim, 41 Bay Rd., East Patchoque, N.Y. 11772

Continuation-in-part of Ser. No. 208,059, Nov. 18, 1980, Pat. No. 4,352,868. This application Oct. 19, 1981, Ser. No. 312,888

Int. Cl.³ H01M *6/36*

U.S. Cl. 429—111 **14 Claims**



1. A tandem photovoltaic device comprising a sandwich structure of at least three semiconductor layers each separated from one another by an intermediate layer of thin film dry solid polymer electrolyte, and electrodes connected to the outer faces of the outer semiconductor layers, one of said outer semiconductor layers adapted to receive incident light on its said outer face, said last mentioned semiconductor having a higher band gap than the adjacent semiconductor.

4,416,960

LI/TiS_2 CURRENT PRODUCING SYSTEM

Daniel J. Eustace, Scotch Plains, and Bhaskara M. L. Rao, Fanwood, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

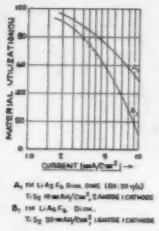
Continuation of Ser. No. 115,997, Jan. 28, 1980, abandoned. This application Sep. 8, 1980, Ser. No. 184,772

Int. Cl.³ H01M *6/14*

U.S. Cl. 429—194 **9 Claims**

1. A current producing electrochemical cell comprising a lithium anode, a titanium disulfide cathode, and an electrolyte having an aqueous pH equal to, or greater than, 6.00, comprising at least one solute of the general formula:

$$LiXF_a$$



wherein X is selected from a group consisting of B, P, Sb, and As, and wherein a is 4 for B and 6 for P, Sb, and As, in a solvent consisting of at least 1,3 dioxolane.

4,416,961

COLOR IMAGING DEVICES AND COLOR FILTER ARRAYS USING PHOTO-BLEACHABLE DYES

Karl H. Drexhage, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 186,105, Sep. 11, 1980, Pat. No. 4,345,011. This application Feb. 16, 1982, Ser. No. 349,282

Int. Cl.³ G03F *5/00;* **G02B** *5/18, 5/22*

U.S. Cl. 430—7 **5 Claims**

1. In a color filter array comprising a layer of a transparent binder containing a planar array of filter elements, the improvement wherein:

the layer has a thickness of less than 10 microns;

at least some of said filter elements contain at least one cationic photo-bleachable dye which selectively absorbs radiation in at least one portion of the spectrum and

said dye is present in said layer in an amount sufficient to impart a density to said layer of at least 0.5 in that portion of the spectrum in which it selectively absorbs.

4,416,962

ELECTROPHOTOGRAPHIC MEMBER HAVING ALUMINUM OXIDE LAYER

Shigeru Shirai, Yamato; Junichiro Kanbe, Yokohama, and Tadaji Fukuda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1981, Ser. No. 328,107

Claims priority, application Japan, Dec. 22, 1980, 55-182471

Int. Cl.³ G03G *5/082*

U.S. Cl. 430—65 **27 Claims**

1. An electrophotographic image-forming member comprising a substrate for electrophotography and a photoconductive layer which is laid on said substrate and comprising an amorphous material containing at least one of hydrogen atom and halogen atom in a matrix of silicon atom, said substrate being constituted of aluminum oxide containing chemi-structually water at least on the surface thereof.

4,416,963

ELECTRICALLY-CONDUCTIVE SUPPORT FOR ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MEDIUM

Masaaki Takimoto; Takashi Saida, and Masataka Murata, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 13, 1981, Ser. No. 253,952
Claims priority, application Japan, Apr. 11, 1980, 55-47665
Int. Cl.³ G03G *5/10*
U.S. Cl. 430—69 **6 Claims**

1. An electrically-conductive support for use in an electrophotographic medium, comprising: a support; and an electrically-conductive layer provided on the support wherein the electrically-conductive layer comprises a binder and electrically conductive metal oxide fine particles having an average grain size of 0.5μ or less and a volume resistivity of 10^6 Ω-cm or less, dispersed in a binder, wherein said electrically-conductive metal oxide fine particles are selected from the group consisting of crystalline metal oxide particles and metal oxide particles containing an oxygen deficiency or small amounts of hetero atoms capable of forming a donor for the metal oxide used, wherein said electrically-conductive support is transparent such that it has a transmittance of light, having a wavelength range including visible light, of about 50% or more, and a light-scattering efficiency of about 50% or less.

4,416,964

DRY MAGNETIC DEVELOPER CONTAINING A NON-PULVERIZING AGGLUMERATE OF CUBIC MAGNETITE PARTICLES

Nobuhiro Miyakawa, Suita; Takashi Teshima, Amagasaki; Haruo Koyama, Hirakata; Kouji Maekawa, Kyoto, and Masanori Fujii, Suita, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Aug. 26, 1981, Ser. No. 296,505
Claims priority, application Japan, Sep. 2, 1980, 55-120689
Int. Cl.³ G03G *9/00*
U.S. Cl. 430—106.6 **1 Claim**

1. A dry magnetic developer consisting essentially of a particulate shaped article of a composition comprising a binder resin medium and a powdery magnetic material dispersed in the binder resin medium, wherein said magnetic material comprises a non-pulverizing agglomerate of cubic magnetite particles in which fine particles of magnetite are so densely aggregated with one another that the particle size distribution is not substantially changed even by five hours' ball-milling treatment, said agglomerate having a number average particle size of 2 to 10 microns as measured by an electron microscope, an apparent density of 0.5 to 1.5 as measured according to the method of JIS K-5101, a saturation magnetization of 75 to 88 emu/g, a residual magnetization of 3 to 12 emu/g, a coercive force of 40 to 150 Oe and substantially the same configuration as that shown in the electron microscope photograph of FIG. 1 of the accompanying drawings, said agglomerate being present in an amount of 40 to 70% by weight based on the sum of amounts of the binder resin medium and the powdery magnetic material, said developer having a number average particle size of 5 to 35 microns, which is at least two times the number average particle size of the agglomerate.

4,416,965

ELECTROSTATOGRAPHIC DEVELOPERS COMPRISING TONERS CONTAINING A POLYESTER HAVING P-HYDROXYBENZOIC ACID RECURRING UNITS

M. Akram Sandhu, Kingsport, Tenn.; John F. Wright, Penfield, and Michel F. Molaire, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 14, 1982, Ser. No. 398,138
Int. Cl.³ G03G *9/08*
U.S. Cl. 430—109 **7 Claims**

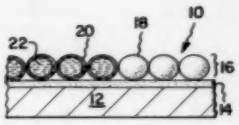
1. An electrographic developer composition containing toner particles comprising a polyester having recurring units derived from diols and diacids and recurring units derived from p-hydroxybenzoic acid characterized in that from about 15–60 mole percent of the recurring units of said polyesters are derived from p-hydroxybenzoic acid.

4,416,966

CAPSULAR IMAGING SYSTEM COMPRISING DECOLORIZING AGENT

Frederick W. Sanders; Richard F. Wright, and Paul C. Adair, all of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Aug. 25, 1982, Ser. No. 411,721
Int. Cl.³ G03C *7/00, 1/40*; B41L *1/20*
U.S. Cl. 430—138 **16 Claims**



1. An imaging system comprising:
an imaging sheet and
a background dye or a combination of a dye precursor and a dye developer which react to form a background dye,
said imaging sheet including:
a support,
a plurality of capsules in a layer on one surface of said support, and
an internal phase contained within said capsules comprising a decolorizing agent and a photohardenable or photosoftenable radiation sensitive composition,
wherein images can be formed by image-wise exposing said sheet to actinic radiation and rupturing said capsules such that said decolorizing agent is image-wise released from said capsules and reacts with said associated background dye to decolorize it or inhibits, prevents or reverses the color forming reaction of said dye precursor and dye developer to produce a color difference in the form of an image.

4,416,967

DIAZO COPYING ELEMENT

Tsutomu Matsuda, Tokyo; Takeo Hirabayashi, Numazu; Takeshi Yanagihara, and Shinjiro Sakurai, both of Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1982, Ser. No. 372,362
Claims priority, application Japan, Apr. 30, 1981, 56-66591
Int. Cl.³ G03C *1/52*
U.S. Cl. 430—159 **8 Claims**

1. In a one-component or two-component diazotype copying element comprising a substrate, a precoat layer coating a surface of said substrate and a diazotype photosensitive layer coating said precoat layer, said diazotype photosensitive layer comprising a photosensitive diazonium compound capable of reacting with a coupler to form a developed visible color image on said diazotype photosensitive layer, the improvment which comprises: said precoat layer consists essentially of a blend of (A) finely divided silica particles, and (B) a copolymer having a glass transition temperature in the range of from −20° C. to 50° C., said copolymer having been prepared by emulsion polymerization of a mixture of monomers comprising (1) from 5 to 40% by weight of at least one first monomer selected from the group consisting of hydroxyalkylacrylates and hydroxyalkylmethacrylates, and (2) from 5 to 60% by weight of at least one second monomer selected from the group consisting of styrene and acrylonitrile, and said weight ratio of (A):(B) is 1:0.5–5.

4,416,968
PREPARATION OF A PRINTING MASTER BY TONING A PHOTOPOLYMER FILM WITH MAGNETIC TONER

Robert P. Held, Englishtown, N.J., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 295,246, Aug. 24, 1981. This application Sep. 9, 1982, Ser. No. 416,362

Int. Cl.³ G03C *5/54, 5/00;* **B41F** *7/00;* **G02B** *7/06*

U.S. Cl. 430—199 **3 Claims**

1. A process of dry printing which comprises:

(1) preparing a magnetic printing master by exposing imagewise to actinic radiation a photopolymerizable layer on a support, so as to generate imagewise tacky and nontacky areas on said support, the tacky areas being those which did not receive radiation, and the nontacky areas being those areas which received radiation; applying to the exposed surface a first magnetic toner comprising ferromagnetic metal oxide particles; simultaneously subjecting the toned surface to a magnetic field, thereby aligning the ferromagnetic particles in the surface of said tacky areas; and then post-exposing said photohardenable element, overall; whereby a printing master is formed which can be dusted with a second magnetic toner which adheres to the first toner and is transferable to a receptor surface; and

(2) preparing one or more copies of the image on the resulting magnetic printing master by toning said master with a second magnetic toner, with added polymer, which adheres to the first magnetic toner on the master, and (3) contacting the doubly toned surface with a receptor surface, while applying heat and pressure, causing the second toner with added polymer to adhere to the receptor surface.

4,416,969
HYDRAZIDE COMPOSITIONS, METHODS EMPLOYING THEM AND PHOTOGRAPHIC MATERIALS CONTAINING THEM

Paul M. Magee, Harrow, and Gareth B. Evans, Berkhamsted, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 1, 1982, Ser. No. 413,903

Claims priority, application United Kingdom, Sep. 2, 1981, 8126621

Int. Cl.³ G03C *5/54, 1/40, 1/28, 5/24*

U.S. Cl. 430—217 **11 Claims**

5. A photographic film unit comprising

(a) an integral imaging receiver element comprising a support, an internal latent image silver halide emulsion comprising a binder, internal latent image silver halide grains and a nucleating agent composition comprising a triazole substituted phenylhydrazide and a thiourea substituted phenylhydrazide wherein the molar ratio of said triazole substituted phenylhydrazide to said thiourea substituted phenylhydrazide is between 1:20 and 20:1, a redox dye-releasing compound associated with said emulsion, and a dye image receiving layer;

(b) a cover sheet comprising a timing layer, a neutralizing layer and a support; and

(c) means for discharging an aqueous alkaline processing composition between the integral imaging receiver element and the cover sheet.

4,416,970
USE OF MANGANOUS COMPOUNDS IN IMAGE TRANSFER ELEMENTS

Thomas O. Maier, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,068

Int. Cl.³ G03C *1/40, 1/10, 7/00, 5/54*

U.S. Cl. 430—218 **30 Claims**

1. In a photographic assemblage comprising:

(a) a photosensitive element comprising a support having thereon at least one silver halide emulsion layer having associated therewith a redox dye-releasing material;

(b) a dye image-receiving layer; and

(c) an alkaline processing composition and means containing same for discharge within said assemblage;

the improvement wherein said assemblage contains a manganous compound that is capable of diffusing to said emulsion layer and said redox dye-releasing material associated therewith only after processing and lowering of the pH of said assemblage, said manganous compound not being initially located in the photosensitive portion of said photosensitive element.

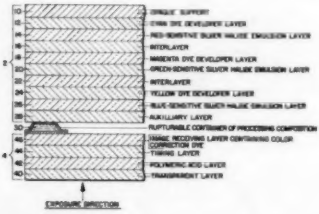
4,416,971
NOVEL XANTHENE COMPOUNDS AND THEIR PHOTOGRAPHIC USE

Alan L. Borror, Lexington; Louis Cincotta, Andover, and John W. Lee, Jr., Harvard, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

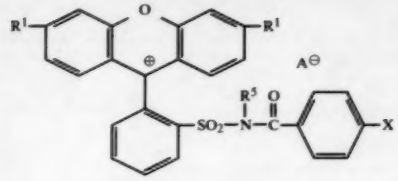
Filed Dec. 28, 1982, Ser. No. 454,092

Int. Cl.³ G03C *7/00, 1/40, 1/84, 5/54*

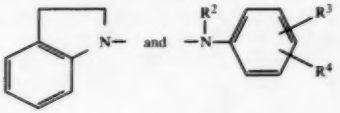
U.S. Cl. 430—221 **46 Claims**



9. A photographic product for forming a multicolor diffusion transfer image, said product comprising a first sheet-like element comprising a first support carrying a red-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer, and a blue-sensitive silver halide emulsion layer, said silver halide emulsion layers having associated therewith, respectively, a cyan dye-providing material, a magenta image dye-providing material and a yellow image dye-providing material; a second sheet-like element comprising a second support; said first and second sheet-like elements being in superposed relationship, or adapted to be brought into superposed relationship, with said supports being outermost; at least one of said supports being transparent to permit photoexposure of said silver halide emulsions therethrough; a rupturable container releasably holding an aqueous alkaline processing composition, said rupturable container being so positioned as to be capable of discharging said processing composition between a pair of predetermined layers carried by said supports; an image-receiving layer carried by one of said supports; and a colored xanthene compound being disposed in a processing composition permeable layer carried by one of said supports, said xanthene compound having the formula



wherein each R^1 is the same and is selected from



R^2 is alkyl, R^3 is an electron-withdrawing group positioned ortho, meta or para to said N atom, R^4 is hydrogen, alkyl or an electron-withdrawing group positioned ortho, meta or para to said N atom; R^5 is alkyl; X is hydrogen, an electron-withdrawing group or an electron-donating group; and A is an anion.

4,416,972

ELECTROLYTIC GRAINING OF ALUMINUM WITH NITRIC AND BORIC ACIDS

John E. Walls, Annandale; Robert L. Dragon, Hazlet, and Thomas A. Dunder, High Bridge, all of N.J., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Jun. 26, 1981, Ser. No. 277,512

Int. Cl.³ G03C *1/94*; C25F *3/04*

U.S. Cl. 430—278 **11 Claims**

1. A method of treating the surface of a sheet of aluminum or the alloys thereof which comprises electrolytically graining said sheet under electrolyzing conditions in an aqueous solution containing at least about 3 gram/liter of nitric acid and from about 1 gram/liter to about the saturation point of boric acid for a sufficient length of time to provide a finely grained surface topography to said sheet.

4,416,973

RADIATION-SENSITIVE POLYIMIDE PRECURSOR COMPOSITION DERIVED FROM A DIARYL FLUORO COMPOUND

David L. Goff, Springfield, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

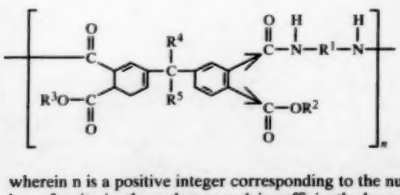
Continuation-in-part of Ser. No. 336,765, Jan. 4, 1982, abandoned. This application Sep. 29, 1982, Ser. No. 427,415

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—281 **17 Claims**

1. A radiation-sensitive polyimide precursor composition, comprising:

a. a polymer of the formula



wherein n is a positive integer corresponding to the number of units in the polymer and is sufficiently large to provide the polymer with a number average molecular weight of about 1500–15,000 as determined by vapor pressure osmometry, and wherein for any particular unit in the polymer: → denotes isomerism; R^1 is a divalent aromatic, aliphatic or cycloaliphatic radical containing at least 2 carbon atoms; R^2 and R^3 are selected from the group consisting of a hydrogen radical and any organic radical containing a photopolymerizable olefinic double bond, at least one of R^2 and R^3 being said organic radical; and R^4 and R^5 are selected from the group consisting of perfluoro and perhalofluoro aliphatic hydrocarbons having 1 to 8 carbons;

b. a radiation sensitive polymerizable polyfunctional acrylate compound; and

c. a photopolymerization initiator system comprising hydrogen donor initiator and aromatic biimidazole.

4,416,974

RADIATION CURABLE CERAMIC PIGMENT COMPOSITION

Bernard J. Scheve, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 217,975, Dec. 19, 1980, Pat. No. 4,306,012, which is a continuation-in-part of Ser. No. 100,609, Dec. 5, 1979, abandoned. This application Nov. 5, 1981, Ser. No. 318,518

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—288 **7 Claims**

1. A radiation curable solvent-free printing medium suitable for screen printing on glass, metal and ceramics, radiation curing and subsequent firing, comprising

(a) about 2 to 25% by weight of a polymerizable liquid prepolymer comprising hydroxyl terminated polyester, polyether or polyester-polyether backbones containing at least about two ethylenically unsaturated end groups and having a number average molecular weight of from about 15,000 to about 80,000;

(b) about 2 to 15% by weight of at least one ethylenically unsaturated, polymerizable monomer selected from acrylate and methacrylate containing a polar functional group;

(c) about 60 to 90% by weight of a ceramic frit; and

(d) about 0.02 to 2% by weight of a polymerization inhibitor.

4,416,975

PHOTOPOLYMERIZATION PROCESS EMPLOYING COMPOUNDS CONTAINING ACRYLOYL GROUPS AND MALEIMIDE GROUPS

George E. Green, Stapleford, England; Ewald Losert, Rheinfelden, Switzerland; John G. Paul, Stirlingshire, Scotland, and Hans Zweifel, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 25, 1982, Ser. No. 361,702

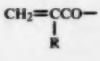
Claims priority, application United Kingdom, Feb. 4, 1981, 8110402

Int. Cl.³ G03C *5/00*

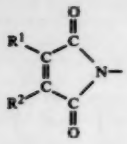
U.S. Cl. 430—327 **20 Claims**

1. A process for production of an image which comprises

(1) exposing to actinic radiation a layer, supported on a carrier, of a liquid composition containing a photoinitiator, a triplet photosensitizer and a compound (A) having in the same molecule both at least one group of formula



and at least one group of formula



II

such that the layer solidifies and becomes essentially nontacky due to photopolymerisation of (A) through the group or groups of formula I but remains substantially photocrosslinkable, and subsequently,

(2) exposing the layer so solidified through an image-bearing transparency consisting of substantially opaque and substantially transparent parts to a substantially greater amount of actinic radiation such that the further exposed part or parts of the photopolymerised layer undergo photocrosslinking through the group or groups of formula II, and

(3) developing the image by dissolving in a solvent the part or parts of the layer which have not become photocrosslinked,

where

R denotes a hydrogen atom or a methyl group and

R^1 and R^2 each denote the same or different alkyl group of 1 to 4 carbon atoms or together they denote a trimethylene or tetramethylene group which may be optionally substituted by a methyl group.

4,416,976

DEVELOPER SOLUTION FOR THE DEVELOPMENT OF EXPOSED NEGATIVE-WORKING DIAZONIUM SALT LAYERS

Loni Schell, Hofheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 31, 1981, Ser. No. 249,617

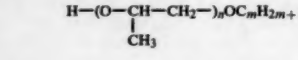
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1980, 3012522

Int. Cl.³ G03C *5/34, 5/00*

U.S. Cl. 430—331 **3 Claims**

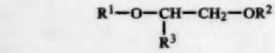
1. A developer solution for the development of exposed, light-sensitive reproduction layers which comprise a water-insoluble binder and a water-insoluble diazonium salt polycondensation product, the essential constituents of the solution being glycol ethers, glycol esters and water, and said solution consisting essentially of, by weight:

(a) 30 to 80 percent of a compound of the formula



wherein n=1 to 4 and m=1 to 5,

(b) 3 to 30 percent of a compound of the formula



wherein R^1 and R^2 are acyl groups containing 1 to 4 carbon atoms, or one of the two groups is a hydrogen atom and R^3 is a hydrogen atom or a methyl group,

(c) 0 to 15 percent of 1,3-dioxolane-2-one or 4-methyl-1,3-dioxolane-2-one,

(d) 0 to 20 percent of a polyhydric alcohol,

(e) 0 to 10 percent of an organic or inorganic salt which is soluble in the solvent mixture, and

(f) 5 to 45 percent of water.

4,416,977

SILVER HALIDE PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Minoru Ohashi; Kiyoshi Futaki, and Katsuaki Iwaose, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

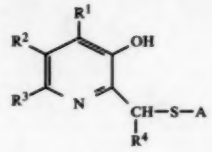
Filed Feb. 16, 1982, Ser. No. 349,092

Claims priority, application Japan, Feb. 17, 1981, 56-21763

Int. Cl.³ G03C *1/34*

U.S. Cl. 430—446 **12 Claims**

1. In a silver halide photograph photosensitive material which comprises a support and at least one photographic layer provided thereon, the improvement which comprises including in at least one of silver halide emulsion layers and colloid layers permeable to water through to or out from said emulsion layer at least one development fog inhibiting compound represented by the following general formula (I):



(I)

wherein A represents the heterocyclic group of a mercapto-antifoggant; R^1, R^2 and R^3 represent each a hydrogen atom, halogen atom, alkyl group, or phenyl group; R^1 and R^2, or R^2 and R^3 may be bonded to each other to form a benzene ring; and R^4 represents a hydrogen atom, alkyl group, or phenyl group.

4,416,978

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Masakazu Morigaki; Morio Yagihara, and Takashi Ozawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 10, 1982, Ser. No. 387,128

Claims priority, application Japan, Jun. 10, 1981, 56/89115

Int. Cl.³ G03C *1/40*

U.S. Cl. 430—548 **26 Claims**

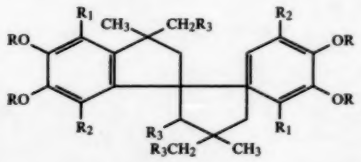
1. A silver halide color photographic light-sensitive material, comprising:

a support base;

a light-sensitive silver halide emulsion:

a magenta color image forming polymer coupler latex; and

a compound represented by the following general formula (I)



wherein R represents an alkyl group, an alkenyl group, an aryl group, a heterocyclic group, a R_4CO- group, a R_5SO_2- group or a R_6NHCO- group; R_1 and R_2, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, an alkenyl group, an alkoxy group or an alkenoxy group; R_3 represents a hydrogen atom, an alkyl group, an alkenyl group or an aryl group; and R_4, R_5 and R_6 each represents an alkyl group, an alkenyl group, an aryl group or a heterocyclic group.

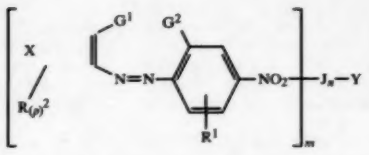
4,416,979

PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT WITH NITROPHYENYLAZO METAL COMPLEXABLE DYE

Jiro Takahashi; Tawara Komamura, both of Hachioji, and Ryuichiro Kobayashi, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 6, 1982, Ser. No. 375,545
Claims priority, application Japan, May 8, 1981, 56-69879
Int. Cl.³ G03C 7/00, 5/54, 1/40, 1/10
U.S. Cl. 430—562 **6 Claims**

1. A photographic light-sensitive element comprising a support having thereon at least one light-sensitive silver halide emulsion layer and a compound represented by the following formula (I):



(I)

wherein G^1 and G^2 independently represent an hydroxy group, an alkali salt thereof or a group which is capable of being hydrolyzed under alkaline conditions, R^1 represents a hydrogen atom, a halogen atom; an alkyl, alkoxy, sulfamoyl, carbamoyl, or alkoxycarbonyl, provided that said respective groups may be substituted, or cyano group; R^2 represents $—NH_2$, $—NHR^4$, $—N(R^4)_2$, $—NHSO_2NHR^4$, $—NHSO_2NHR^4$, $—NHCOR^4$, $—NHSO_3R^4$, —OH, $—OR^4$, $—OCOR^4$ or $—O-CO_2R^4$ wherein R^4 represents an alkyl or aryl provided that respective groups may be substituted; X represents a group of atoms necessary to complete a naphthalene or benzene ring provided that said respective rings may be substituted; Y represents a ballasting carrier portion which is capable of releasing a diffusible azo dye as a function of the development of the silver halide in said silver halide emulsion layer under alkaline conditions; J represents a divalent linking group; p is an integer of 1 or 2; m is an integer of 1 to 3; and n is 0 or an integer not more than m.

4,416,980

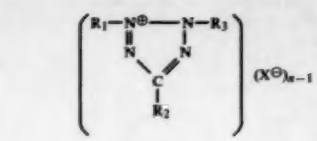
HIGH-CONTRAST LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Mitsuto Fujiwhara; Syunji Matsuo; Toyoaki Masukawa; Yutaka Kaneko, and Mikio Kawasaki, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 91,558, Nov. 5, 1979, abandoned, which is a continuation of Ser. No. 869,657, Jan. 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 710,385, Aug. 2, 1976, abandoned. This application Sep. 4, 1980, Ser. No. 184,095
Claims priority, application Japan, Jan. 28, 1977, 52-7845
Int. Cl.³ G03C 1/06
U.S. Cl. 430—567 **10 Claims**

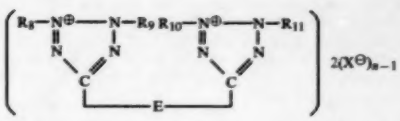
1. A high-contrast light-sensitive silver halide photographic material which comprises a support, a (i) silver halide emulsion containing silver halide grains, said silver halide grains in said silver halide emulsion having an average grain size between 0.25 and 0.5 μm and, at least 80% of said silver halide grains are of a grain size which falls within the range of from 0.6 times said average grain size to 1.4 times said average grain size, and (ii) another hydrophilic colloidal layer coated on the support, at least one layer selected from the group consisting of said silver halide emulsion layer and said another hydrophilic colloidal layer containing at least one substantially non-diffusible compound having oxidizing power on a hydroquinone developing agent and selected from the group consisting of

(a) a tetrazolium compound having the following formula:



I

II



III

wherein R_1, R_3, R_4, R_5, R_8, R_9, R_{10} and R_{11} individually represent an alkyl group including alkyl and substituted alkyl, an allyl group including allyl and substituted allyl, a phenyl group including phenyl and substituted phenyl, a naphthyl group including naphthyl and substituted naphthyl, a heterocyclic group including heterocyclic and substituted heterocyclic or may be a group forming a metal chelate or complex; R_2, R_6 and R_7 individually represent an allyl group including allyl and substituted allyl, a phenyl group including phenyl and substituted phenyl, a heterocyclic group including heterocyclic and substituted heterocyclic, an alkyl group including alkyl and substituted alkyl, an amino group including amino and substituted amino, hydroxyl, carboxyl or salt thereof, mercapto, nitro or hydrogen; D represents an arylene group; E represents an alkylene group including alkylene and substituted alkylene, an allylene group including allylene or substituted allylene or an aralkylene group including aralkylene and substituted aralkylene; $X^{\ominus}$ represents an anionic surface active moiety having at least 9 carbon atoms; n represents an integer 1 or 2 providing that when the compound forms a molecular inner salt, n is 1,

(b) a triazolium compound having the formula; $[T]^{\oplus}(X^-)_n$ wherein $[T]^{\oplus}$ represents triazolium cation selected from 1-Methyl-2-phenyl-2H-1,2,3-triazolium, 1-n-propyl-2-phenyl-2H-1,2,3-triazolium, 2-(4-Methoxyphenyl)-3-phenyl-2H-naphtho[1,2-d]-1,2,3-triazolium, 1,5-(9,10-anthraquinolyl)-bis-{2-[3-phenyl]-2H-naphtho-[1,2-d]-1,2,3-triazolium} and 2,3-di(4-Methoxyphenyl)-5-nitro-2H-naphtho-[1,2-d]-1,2,3-triazolium, n is 1, and X^- represents an anionic surface active moiety having at least 9 carbon atoms,

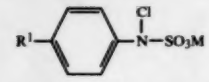
(c) a bipyridinium compound having the formula; $[B]^{2+}(X^-)_2$ wherein $[B]^{2+}$ represents a bipyridinium cation selected from 1,1'-Dimethyl-4,4'-bipyridinium, 1,1'-Diethyl-4,4'-bipyridinium and 1,1'-Dibenzyl-4,4'-bipyridinium, and X^- represents an anionic surface active moiety having at least 9 carbon atoms,

(d) a metal complex compound represented by the general formula; $[M'-Z]^{n'\oplus}(X^{\ominus})_{n'}$ wherein M' represents a metal, n' is an integer of 2 to 4, Z represents ligands which form metal complex compound, $[M'-Z]^{\oplus}$ being selected from hexaammine cobalt (III), triethylenediamine cobalt (III), bis(diethanolamine) cobalt (III), hexaammine chromium (III), bis(dipropanolamine) chromium (III), bis(ethylenediamine) trimethylenediamine cobalt (III) and ethylenediamine tetraacetic acid iron (III), and $X^{\ominus}$ represents an anionic surface active moiety having at least 9 carbon atoms,

(e) a non-diffusible inorganic oxidant selected from tetra-

phenylphosphonium bichromate, tetraphenylphosphonium permanganate and tetraphenylarsonium perchromate and

(f) an N-chloroarylsulfonamide compound represented by the general formula;



wherein R^1 represents an alkyl group including alkyl and substituted alkyl having 6 to 12 carbon atoms, M represents an alkali metal atom,

said substantially non-diffusible compound being a compound which when said photographic material is inserted into an aqueous developing solution will not diffuse from said photographic material in an amount greater than 2%,

said at least one layer containing said substantially non-diffusible compound having the following swelling characteristics:

when said at least one layer is dried at 23° C. in an atmosphere having a relative humidity of 55% and is then immersed in an aqueous solution having a temperature of 23° C. and the following composition

ethylenediaminetetraacetic acid disodium	0.1 g
sodium sulfite	30 g
potassium bromide	2.5 g
sodium carbonate monohydrate	30 g
sodium hydroxide	1 g
water to make a total of	1 l
pH	10.25

it will swell to a thickness which is from 1.2 to 4.5 times the thickness of said at least one layer when dried.

4,416,981

BENZOTHIAZOLINE DERIVATIVES AS SILVER HALIDE ANTIFOGGANTS

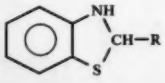
Joseph D. Overman, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Apr. 29, 1982, Ser. No. 373,280

Int. Cl.³ G03C *1/34*

U.S. Cl. 430—614 **4 Claims**

1. A photographic element comprising a support containing a silver halide emulsion coated thereon, characterized in that said emulsion contains an antifogging amount of a benzothiazoline derivative of the formula



wherein R is H, alkyl, aryl, or substituted alkyl or aryl.

4,416,982

COMPOSITION AND METHOD FOR DECOMPOSING HYDROGEN PEROXIDE

Mitsuru Tsuda, Mishima; Akira Miike; Yoshiaki Shimizu, both of Shizuoka; Yasuharu Yokote, Tokyo, and Toshio Tatano, Numazu, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,603

Claims priority, application Japan, Nov. 14, 1980, 55-159403

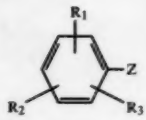
Int. Cl.³ C12Q *1/60, 1/54, 1/52, 1/44, 1/42, 1/40, 1/26, 1/28, 1/00*

U.S. Cl. 435—11 **9 Claims**

1. A method for determination of an analyte which can be converted by the action of an enzyme (B) to the compound (A) which can be directly oxidized by the action of an oxidase capable of oxidizing the compound (A), which comprises the following steps:

(1) compound (A) in the original sample is oxidized by the action of the oxidase to form hydrogen peroxide;

(2) the resultant hydrogen peroxide is decomposed by adding peroxidase and a compound represented by the formula (I)



(I)

wherein Z represents OH or NR_4R_5 wherein R_4 and R_5 are the same or different and represent hydrogen atom, alkyl, substituted alkyl or acyl, and R_1, R_2 and R_3 are the same or different and represent hydrogen atom, halogen atom, alkyl, alkoxy, amino, nitro, carboxyl or sulphonyl;

(3) the analyte is converted to compound (A) by the action of enzyme (B);

(4) the resultant compound (A) is oxidized by the action of the oxidase to form hydrogen peroxide; and

(5) the resultant hydrogen peroxide is determined by a known method.

4,416,983

DETERMINATION OF NAD(P)H OR SALICYLATE

Albert Röder, Seeshaupt; Joachim Siedel, Bernried; Hans Möllering, Tutzing; Hans Seidel, Tutzing, and Helmgard Gauhl, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 328,312

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046741

Int. Cl.³ C12Q *1/26, 1/32, 1/38, 1/40, 1/14, 1/54, 1/56, 9/02*

U.S. Cl. 435—25 **8 Claims**

1. Method for the determination of NAD(P)H or of salicylate comprising;

(a) decarboxylating salicylate by use of salicylate hydroxylase in a NAD(P)H dependent reaction in the presence of tyrosinase and of an appropriate chromogenic component selected from the group consisting of hydrazones and amines to form a colored material by oxidative coupling of the decarboxylation product with the said chromogenic component; and

(b) determining the colored material formed photometrically.

4,416,984

STERILIZATION INDICATOR

Robert P. Wheeler, Jr., Keene, N.H., assignor to Concord Laboratories, Inc., Keene, N.H.

Filed May 22, 1981, Ser. No. 266,184

Int. Cl.³ C12Q *1/22;* C12M *1/00, 1/24, 1/18*

U.S. Cl. 435—31 **13 Claims**

1. A sterilization indicator comprising:

a first compartment having at least one open end;

a gas-permeable, bacteria-impermeable closure covering said open end;

said first compartment containing a number of viable microorganisms;

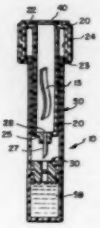
a second compartment, said first and second compartments being moveable with respect to each other;

said second compartment having a predetermined quantity of nutrient medium for promoting the growth of said microorganisms;

separation means separating the nutrient medium in said second compartment from said microorganisms in said

first compartment until it is desired to contact said microorganisms with said nutrient medium;

communication means for providing communication between said first compartment and said second compartment by penetrating said separating means when it is desired to contact said microorganisms with said nutrient medium;



activation means for activating said communication means by relative movement between said first and second compartments to provide communication between said first compartment and said second compartment without breaking said second compartment by engaging and penetrating said separation means; and

a detector composition contained in one of said compartments that is capable of undergoing a detectable change in response to the growth of said microorganisms.

4,416,985

PROCESS FOR PREPARING 3β,7β-DIHYDROXY-Δ⁵-STEROIDS

Karl Petzoldt; Rudolf Wiechert; Henry Laurent; Klaus Nickisch, and Dieter Bittler, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

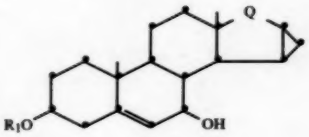
Filed Nov. 3, 1981, Ser. No. 317,822

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3042136

Int. Cl.³ C12P *33/06;* C07J *7/00*

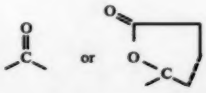
U.S. Cl. 435—58 **5 Claims**

1. A process for preparing a 3β,7β-hydroxy-Δ⁵-steroid of the formula



wherein

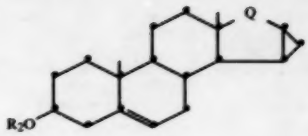
Q is



and

R_1 is hydrogen,

comprising fermenting a 3β-hydroxy-Δ⁵-steroid of the formula



wherein

Q is as defined above, and

R_2 is hydrogen or alkanoyl of 2–6 carbon atoms,

with a culture of *Botryodiplodia malorum* to obtain the corresponding 3β,7β-dihydroxy-Δ⁵-steroid; and,

isolating the 3β,7β-dihydroxy-Δ⁵-steroid.

4,416,986

METHODS OF PRODUCING HBSAG

Henry Z. Markus, Wyncote, and William J. McAleer, Ambler, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 16, 1981, Ser. No. 225,555

The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.

Int. Cl.³ C12N *5/00, 5/02;* C12P *21/00*

U.S. Cl. 435—68 **7 Claims**

1. A method for preparing hepatitis B surface antigen which comprises growing cells which shed hepatitis B surface antigen in the presence of a nutrient medium on hollow fiber capillary units having a molecular weight cut-off of about 10,000.

4,416,987

METHOD OF SYNTHESIZING PROTEINS FROM METHANOL

Bruno Cabane, Saint Cloud, and Pierre Galzy, Montpellier, both of France, assignors to PCUK - Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation of Ser. No. 859,873, Dec. 12, 1977, abandoned. This application Nov. 18, 1981, Ser. No. 322,566

Claims priority, application France, Dec. 14, 1976, 76 37604; May 27, 1977, 77 16283

Int. Cl.³ C12N *15/00*

U.S. Cl. 435—68 **5 Claims**

1. A method for synthesizing proteins from methanol which comprises

(a) culturing a *Pseudomonas stuzeri, Pseudomonas aeruginosa methylotrophus,* or a *Micrococcus varians methylotrophus* micro-organism on a medium containing methanol as the sole carbon source and glycine at a sufficient temperature, and pH, to produce glycine resistant methylotrophic mutant strains,

(b) recovering said mutant strains, and

(c) culturing said mutant strains at a sufficient temperature and pH to produce proteins.

4,416,988

DETECTION AND ISOLATION OF ENKEPHALIN MRNA USING A SYNTHETIC OLIGODEOXYNUCLEOTIDE

Harvey Rubin, 2560 First Ave., San Diego, Calif. 92103

Division of Ser. No. 219,435, Dec. 23, 1980, Pat. No. 4,358,586. This application Sep. 17, 1982, Ser. No. 389,564

Int. Cl.³ C12P *19/34;* C07H *21/04*

U.S. Cl. 435—91 **4 Claims**

1. The method of isolating endorphin mRNA:cDNA from pancreas, brain, adrenal and pituitary tissue which comprises the steps of:

extracting total RNA from brain, adrenal, pancreas or pituitary tissue;

isolating A+ RNA from said total RNA;

hybridizing under suitable conditions and temperatures said A+ RNA with a 15 base oligodeoxynucleotide CATx-AAyCCyCCGTA, wherein "A" represents adenine, "T"

represents thymine, "G" represents guanine, "C" represents cytosine, "x" represents guanine or adenine and "y" represents guanine, thymine, cytosine or adenine;

copying the hybridized endorphin mRNA into complementary DNA; and

isolating said complementary DNA, whereby substantially only endorphin mRNA:cDNA remains, substantially all other RNA fractions having been removed.

4,416,989

METHOD OF CONTINUOUS TREATMENT OF GRAIN MASH FOR PRODUCING ETHANOL

Rolf H. Kretz, Singen, Fed. Rep. of Germany, assignor to Process Engineering Company S.A., Maennedorf, Switzerland

Filed Nov. 16, 1981, Ser. No. 321,897

Claims priority, application Switzerland, Nov. 25, 1980, 8684/80

Int. Cl.³ C12C *7/04;* C12P *7/06*

U.S. Cl. 435—93 10 Claims

1. A method of producing grain mash for producing ethanol, comprising the steps of comminuting a starch-containing raw material in a comminuting device with sieve openings of about 1–3 mm diameter to produce particles of the starch-containing raw material, enzymatic liquefying the starch-containing particles of raw material in a liquefying container in the form of a sedimentation container, continuously separating non-decomposed coarser ones of the particles of raw material in the container, continuously withdrawing the separated coarser particles of raw material from the container, continuously comminuting the withdrawn coarse particles in a wet comminuting device to a substantially smaller particle size, and continuously recirculating the smaller particles of raw material from the wet comminuting device into the liquefying container.

4,416,990

ENZYMATIC CLARIFICATION PROCESS FOR IMPROVING THE INJECTIVITY AND FILTRABHILITY OF XANTHAN GUMS

Marguerite Rinaudo, Grenoble; Michel Milas, Eybens, and Norbert Kohler, Le Chesnay, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Oct. 6, 1981, Ser. No. 309,147

Claims priority, application France, Oct. 6, 1980, 80 21395

Int. Cl.³ C12P *19/06;* C13L *3/00;* C12R *1/645*

U.S. Cl. 435—104 14 Claims

1. A process for enzymatically purifying, an impure xanthan gum containing, as impurities, at least one of bacterial cell residues or microgels, which comprises contacting an aqueous dispersion of said impure xanthan gum with a polysaccharase enzyme preparation of Basidiomycetes Polyporaceae cellulose, said aqueous dispersion having a pH from 3 to 7 and a total concentration of alkali and/or alkaline-earth metal salts dissolved therein of at least 10^{-1} equivalent/liter; wherein said contacting is effected at a temperature sufficient to allow the removal of said cell residues and microgels without substantially hydrolysing the xanthan gum; whereby the viscosity of said aqueous dispersion is not substantially decreased.

4,416,991

METHOD FOR ENZYMATIC TRANSESTERIFICATION OF LIPID AND ENZYME USED THEREIN

Takaharu Matsuo; Norio Sawamura, both of Sennan; Yukio Hashimoto, Kishiwada, and Wataru Hashida, Osaka, all of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Mar. 9, 1981, Ser. No. 241,845

Claims priority, application Japan, Mar. 8, 1980, 55-29707; Mar. 8, 1980, 55-29708

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.³ C12P *7/64;* A23D *5/00*

U.S. Cl. 435—134 13 Claims

1. A method for the enzymatic transesterification of a lipid which comprises continuously or repeatedly contacting an enzyme or an enzyme preparation having transesterification activities with a fresh supply of a dried fatty ester substrate while maintaining the total amount of water in the reaction system at or below the solubility limit of water in the fatty acid ester used.

4,416,992

SUPPORT MATRICES AND IMMOBILIZED ENZYME SYSTEMS

Blaise J. Arena, Des Plaines, and Ronald P. Rohrbach, Forest Lake, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Mar. 26, 1982, Ser. No. 362,206

Int. Cl.³ C12N *11/14, 11/08, 11/06*

U.S. Cl. 435—176 34 Claims

1. A method of preparing a support matrix comprising contacting a porous, refractory inorganic oxide selected from the group consisting of alumina, silica, titania, thoria, and combinaticns thereof, with titanium tetrahalide in the absence of a solvent for the titanium tetrahalide so as to produce a surface titanated inorganic oxide, removing excess and unreacted titanium tetrahalide, heating the titanated inorganic oxide at a temperature from about 80° to about 200° C. in an inert atmosphere of nitrogen, argon, helium, or in a vacuum, for a time sufficient to volatilize any remaining unreacted titanium tetrahalide, contacting the resulting material with a diamine, selected from the group of alkylene diamines containing from 2 to about 10 carbon atoms and phenylene diamine, or a polyamine of formula $H_2N(CH_2CH_2NH)_xH$, where x is an integer from 2 to about 2300, removing excess amine, treating the resulting material with an excess of a bifunctional reagent selected from the group consisting of phthalaldehyde, toluene diisocyanate, and $X(CH_2)_pX$, where X is an aldehyde, CHO, or isocyanate, NCO, functional group and p is an integer from 2 to about 8, removing the excess and unreacted bifunctional reagent, and recovering the resulting support matrix.

4,416,993

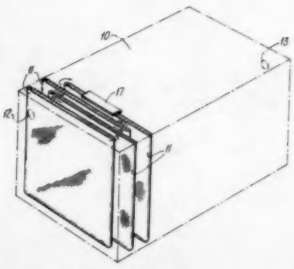
APPARATUS WITH SEMI-PERMEABLE MEMBRANE, AND METHOD FOR CULTIVATING MICRO-ORGANISMS

John B. McKeown, Bothwell, Scotland, assignor to McLeod & Miller (Engineers) Limited, Glasgow, Scotland

Filed Jun. 11, 1981, Ser. No. 272,547

Int. Cl.³ C12N *1/00*

U.S. Cl. 435—243 9 Claims



1. Apparatus for cultivation of micro-organisms comprising a first vessel capable of holding liquid a second vessel having semi-permeable walls which permit the passage of gas but not liquid, extending into the first vessel and providing therein an outwardly facing surface upon which a micro-organism can be cultivated, and means for delivering gas into the second vessel such that the gas can pass through the semi-permeable walls into the first vessel.

4,416,994

PLASMID pEL7 AND RELATED CLONING VECTORS FOR USE IN STREPTOMYCES AND RELATED ORGANISMS

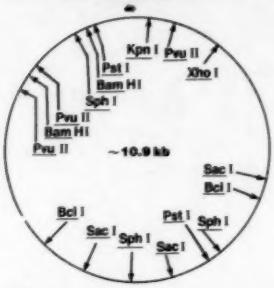
Walter M. Nakatsukasa; Jeffrey T. Fayerman, and James A. Mabe, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 19, 1981, Ser. No. 312,446

Int. Cl.³ C12N *1/20, 15/00, 1/00;* C12P *21/00, 21/02;* C12R *1/465*

U.S. Cl. 435—253 70 Claims

Restriction Site and Functional Map of Plasmid pEL7



1. A novel pair of recombinant DNA cloning vectors, said pair comprising:

(a) novel plasmid pEL7, and

(b) a second plasmid that is functionally dependent upon plasmid pEL7, said second plasmid comprising a restriction fragment of plasmid pEL7 and one or more different DNA segments that convey resistance to at least one antibiotic when transformed into a sensitive host cell, said host cell being susceptible to transformation, cell division, and culture.

33. A transformed restrictionless host cell selected from the group consisting of restrictionless cells of *Streptomyces, Streptosporangium, Actinoplanes, Nocardia, Micromonospora, Bacillus,* and *Staphylococcus* comprising a pair of recombinant DNA cloning vectors of claim 1.

4,416,995

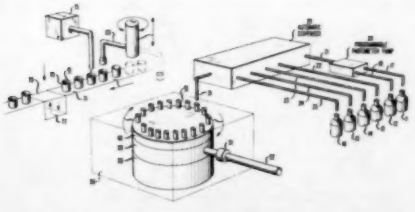
METHOD AND APPARATUS FOR DETERMINING BACTERIAL SENSITIVITY

Leonard Amaral, Pound Ridge, N.Y., assignor to Bronx-Lebanon Hospital Center, Bronx, N.Y.

Filed Sep. 10, 1981, Ser. No. 300,943

Int. Cl.³ C12M *1/34, 1/12;* C12Q *1/18, 1/16*

U.S. Cl. 435—291 16 Claims



1. A system for determining the activity of a select chemical upon a bacterial sample containing bacteria in a bacterial growth medium and the select chemical, the system comprising:

dispensing means for adding radioactively-labelled thymidine or thymidine analog to the bacterial sample;

incubating means for maintaining a desired incubation environment for the bacterial sample before and after addition of radioactively-labelled thymidine or thymidine analog to the bacterial sample;

separator means for separating said bacteria from said bacterial growth medium, said select chemical, and a portion of said radioactively-labelled thymidine or thymidine analog after incubation; and

radioactivity measuring means for measuring radioactive radiation emanating from said separated bacteria.

4,416,996

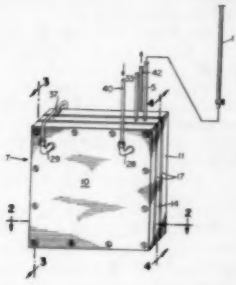
HYDROGEN BLISTERING CORROSIVITY METERING MEANS AND METHOD

Byron von Klock, and Dinh-Cuong Vuong, both of Beaumont, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,720

Int. Cl.³ G01N *17/00*

U.S. Cl. 436—6 24 Claims



1. A method of monitoring hydrogen blistering corrosivity comprising

containing a predetermined volume of measuring liquid in a container having at least one steel membrane as a side,

contacting a liquid to be tested with the steel membrane in a manner so that hydrogen atoms formed by the corrosive activity of the test liquid with the steel membrane passes through the steel membrane to the measuring liquid, and

measuring a change in the volume of the measuring liquid resulting from the corrosive activity of the test liquid with the steel membrane.

4,416,997

PYRIDINE-FREE KARL FISCHER REAGENT USEFUL IN DETERMINING WATER

Wolfgang Fischer, Darmstadt, and Karl-Dieter Krenn, Pfungstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 21, 1981, Ser. No. 333,100

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048237

Int. Cl.³ G01N *31/16, 27/42, 33/18;* C09K *3/00*

U.S. Cl. 436—42 12 Claims

1. An essentially pyridine-free Karl Fischer reagent useful in the determination of water, comprising a dissolving agent containing sulfur dioxide and a pyridine substitute in a Karl Fischer solvent, and a titrating agent containing iodine in a Karl Fischer solvent, wherein the pyridine substitute is an alkali or alkaline earth metal benzoate or ammonia, and the reagent is essentially free of pyridine.

4,416,998

SILVER STAIN PROCEDURE AND KIT FOR SAME

Lonnie D. Adams, Gobles, and David W. Sammons, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 250,512, Apr. 2, 1981, abandoned. This application Mar. 17, 1982, Ser. No. 359,339

Int. Cl.³ G01N *33/68*

U.S. Cl. 436—86 **13 Claims**

1. A method for staining a substance which is capable of binding silver which is supported in a matrix which comprises the steps of treating said substance with a 2.5–25% glutaraldehyde solution, washing said substance with water, equilibrating said substance in an aqueous silver salt solution, subjecting said substance to a reducing solution, and immersing said substance in multiple and sequential aqueous carbonate or sulfate salt solutions.

4,416,999

REFRACTORY POWDER FLAME PROJECTION MOLDINGS

Fukuoka Hiromi, Fukuokaken; Masataka Matsuo, Nakamashi; Kazuo Hamai, Kitakyusyushi; Tokuaki Hatta, Kitakyusyushi, and Mituo Sugawara, Kitakyusyushi, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Kurosaki Yogyo Co., Ltd., Fukuokaken, both of, Japan

Filed Aug. 5, 1981, Ser. No. 290,202

Int. Cl.³ C04B *35/02, 35/58*

U.S. Cl. 501—94 **7 Claims**

1. A refractory powder flame projection molding comprising nonfused refractory particles having a particle size of 0.2 to 10 mm dispersed and embedded in the solidified structure of a fused refractory material formed by the flame projection of a refractory material having a particle size less than 0.2 mm.

4,417,000

DIMETHYL ETHER PROCESS

Lynn H. Slaugh, Cypress, and Robert C. Ryan, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 4, 1982, Ser. No. 405,112

Int. Cl.³ C07C *27/06, 41/01*

U.S. Cl. 518—713 **5 Claims**

1. A process for the production of dimethyl ether in high yield from carbon monoxide and hydrogen which comprises contacting said carbon monoxide and hydrogen at a temperature between about 250° C. and about 350° C. and a pressure between about 30 to about 300 atmospheres with a catalyst comprising a physical mixture of two components; a first component comprising an alkali metal oxide promoted copper-zinc catalyst supported on an alumina carrier and a second component comprising tungsten oxide supported on a carrier selected from silica-alumina, silica or alumina wherein said first component comprises from about 25 to about 75 percent by volume of the total catalyst volume.

4,417,001

LOW SMOKE ISOCYANURATE MODIFIED URETHANE FOAM AND METHOD OF MAKING SAME

Glenn R. Svoboda, Grafton; William L. Carlstrom, and Richard T. Stoehr, both of West Bend, all of Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Filed Sep. 20, 1982, Ser. No. 419,748

Int. Cl.³ C08J *9/02*

U.S. Cl. 521—114 **12 Claims**

1. An isocyanurate modified urethane foam formed by reacting an organic isocyanate and an an organic polyol in the presence of a halogenated blowing agent, the —NCO/—OH index of said reactants being between 1.3 and 3.0 and wherein as a catalyst for said reaction is employed one or more catalysts capable of causing the reaction of isocyanate and hydroxyl radicals to form a polyurethane and of causing a trimerization reaction of the excess isocyanate radicals to produce the isocyanurate modification of said urethane foam and wherein from about 5%–100% of the polyol employed in said foam reaction consists of a digestion product obtained by digesting polyalkylene terephthalate in a reactive solvent selected from the class consisting of organic diols and triols having an average molecular weight of from 62–500.

4,417,002

FOAM MANUFACTURE

Bernhard Liessem, Eupen, Belgium, assignor to Kabel-und-Gummiwerke AG, Eupen, Belgium

Filed Jul. 7, 1982, Ser. No. 396,124

Claims priority, application United Kingdom, Jul. 9, 1981, 8121185; Aug. 22, 1981, 8125721

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—128 **10 Claims**

1. A method of manufacturing foam material in which such material is formed in the presence of a blowing agent, characterised in that the blowing agent comprises at least one substance, selected from formic acid and salts of formic acid, which is reacted with an isocyanate to liberate gas.

4,417,003

FOAMABLE POLYMERIC STYRENE PARTICLES

Richard A. Schwarz, Big Spring, Tex., assignor to Cosden Technology, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 423,487, Sep. 24, 1982, Pat. No. 4,388,418. This application Apr. 8, 1983, Ser. No. 483,407

The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.

Int. Cl.³ C08J *9/20*

U.S. Cl. 521—56 **6 Claims**

1. An expandable polymeric styrene particle having incorporated therein from about 0.1% to about 0.5% by weight of bis (allyl ether) of tetrabromobisphenol A and from about 0.5% to about 2.5% by weight of dibromoethyldibromocyclohexane, all percentages being based upon the weight of the polymeric styrene.

4,417,004

PHENOL FORMALDEHYDE FOAMS

Krishan K. Sudan, Laval, and Antoine Berchem, St. Hippolyte, both of Canada, assignors to Reichhold Limited, Islington, Canada

Continuation-in-part of Ser. No. 919,972, Jun. 28, 1978, Pat. No. 4,219,623. This application Dec. 5, 1979, Ser. No. 100,378

The portion of the term of this patent subsequent to Aug. 26, 1997, has been disclaimed.

Int. Cl.³ C08G *8/00, 14/04;* **C08J** *9/04;* **C08G** *65/38*

U.S. Cl. 521—181 **14 Claims**

1. A two container pack for providing, on mixing of the two parts of the pack, a phenol-formaldehyde resin foam, which two part pack comprises:

in a first part, in stable combination, a phenolic resin, a blowing agent which is an inert low boiling liquid, an effective amount of a nitrogenous modifier capable of permitting dispersion of the blowing agent in the resin, and a surfactant; and

in a second container in stable combination an acid catalyst composition dispersed in a polyhydroxy compound, in a weight ratio of acid catalyst to polyhydroxy compound of at least 1:1.

4,417,005

RUBBER COMPOSITIONS FOR TIRE TREADS

Akinori Tokieda, Chigasaki, and Sumio Takasugi, Hiratsuka, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,558
Claims priority, application Japan, Feb. 13, 1981, 56-18904; May 29, 1981, 56-80722
Int. Cl.³ C08J 3/18, 3/20; C08K 3/04; C08L 9/06
U.S. Cl. 523—351 4 Claims

1. A rubber composition for tire treads which comprises:

(I) 20–80 parts by weight, calculated as the rubber ingredient, of an extender oil-extended styrene-butadiene copolymer rubber having a Mooney viscosity (ML_{1+4}, 100° C.) of at least 53 prepared by extending a styrene-butadiene copolymer rubber having a styrene content of at least 20% by weight and up to 20% of 1,2-butadiene bonding units with an aromatic oil having a V.G.C. of 0.900–0.999 as the extender oil,

(II) 80–20 parts by weight of at least one other diene rubber, the extender oil-free styrene-butadiene copolymer rubber and the at least one other diene rubber totalling 100 parts by weight, and

(III) 40–70 parts of carbon black having an I_2 adsorption of 60–130 mgI_2/g and a DBP absorption of up to 130 ml/100 g.

4,417,006

ORGANOPOLYSILOXANE COATING COMPOSITIONS

Frank D. Graziano, Lake Bluff, and Edmund J. Kuziemka, Naperville, both of Ill., assignors to Material Sciences Corporation, Elk Grove Village, Ill.

Continuation-in-part of Ser. No. 271,219, Jun. 8, 1981. This application Sep. 29, 1982, Ser. No. 427,508
The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.
Int. Cl.³ C08K 5/15
U.S. Cl. 523—435 6 Claims

1. A fast-curing resin coating composition comprising:

(i) 10–25 parts of an epoxy resin of molecular weight 50,000 to 200,000,

(ii) 1–3 parts of an etherified resol phenolic resin,

(iii) 1–3 parts of a silicone fluid comprised of methylphenylsiloxanes, dimethylsiloxanes and diphenyldemethylsiloxanes,

(iv) 12–20 parts of an organopolysiloxane release resin prepared by

(a) agitating a mixture comprising (A) an organohalosilane blend consisting essentially of about 60 mole percent methyltrichlorosilane, about 35 mole percent phenyltrichlorosilane, and about 5 mole percent dimethyldichlorosilane, (B) water, (C) acetone, and (D) a water-immiscible organic solvent, wherein there is present by weight in said mixture per part by weight of (A), about 1.7 to about 10 parts of (B), about 0.2 to about 5 parts of (C), and about 0.3 to about 5 parts of (D); and

(b) separating the organic solvent solution of (F) from the resulting hydrolysis mixture of a step (i), wherein (F) is a silanol-containing organopolysiloxane resin having an average ratio of about 1.05 organic radicals per silicon atom,

(vi) a catalytic amount of an zinc-iron organometallic curing agent, in a

(vii) suitable solvent, all of the parts being parts by weight.

4,417,007

ZINC RICH PAINT FORMULATIONS EMPLOYING MANGANOMANGANIC OXIDE FUME PIGMENT

George A. Salensky, Whitehouse Station, N.J.; Kuldip S. Chopra, Grand Island, and Nicholas J. Pappas, Somers, both of N.Y., assignors to Elkem Metals Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 278,967, Jun. 30, 1981, abandoned. This application May 26, 1982, Ser. No. 381,790
Int. Cl.³ C08K 3/22; C09D 3/58, 5/08
U.S. Cl. 523—442 11 Claims

1. A paint formulation comprising: from about 4 to 25% by weight of a resin binder comprising an epoxy resin compound derived from bisphenol A and epichlorhydrin which are hardened with polyamines selected from the group consisting of polyaminoamides, diethylene triamine, triethylene tetramine and coal tar amines; from about 43 to 90% by weight zinc dust; from about 3 to 38% by weight Mn_3O_4 fume pigment; from 0 to about 35% by weight of additional pigments including pigment extenders and fillers; from 0 to 5% by weight of a pigment suspension agent; and the balance being a solvent in an amount required for proper application viscosity.

4,417,008

IMPROVED COLOR PIGMENT FOR SOLVENT-BASE PAINT FORMULATIONS

George A. Salensky, Whitehouse Station, N.J.; Kuldip S. Chopra, Grand Island, and Nicholas J. Pappas, Somers, both of N.Y., assignors to Elkem Metals Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 279,097, Jun. 30, 1981, abandoned. This application May 26, 1982, Ser. No. 381,791
Int. Cl.³ C08K 3/22; C09D 3/58, 5/08
U.S. Cl. 523—442 6 Claims

1. A solvent base paint formulation comprising: from about 10 to 30% by weight of a resin binder comprising an epoxy resin compound derived from bisphenol A and epichlorhydrin which are hardened with polyamines selected from the group consisting of polyaminoamides, diethylene triamine, triethylene tetramine and coal tar amines; from about 20 to 35% by weight Mn_3O_4 fume pigment; from about 2 to 25% by weight of additional pigments including pigment extenders, fillers and corrosion inhibitors; from about 0 to 1.5% by weight of a pigment suspension agent; and from about 30 to 90% by weight of a solvent.

4,417,009

PYROPHOSPHATO TITANATE ADDUCTS

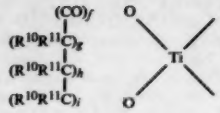
Gerald Sugerman, Allendale, N.J., and Salvatore J. Monte, Staten Island, N.Y., assignors to Kenrich Petrochemicals, Inc., Bayonne, N.J.

Division of Ser. No. 224,055, Jan. 12, 1981, Pat. No. 4,338,220, which is a division of Ser. No. 70,907, Aug. 29, 1979, Pat. No. 4,277,415. This application Mar. 26, 1982, Ser. No. 362,091
Int. Cl.³ C08K 9/00
U.S. Cl. 523—451 6 Claims

1. A composition comprising an inorganic solid, a polymeric material and a titanate having the following formula

$$X_xTi[OP(O)(OR^1)OP(O)(OR^2)(OR^3)]_4\text{-}_c(NR^4R^5R^6)_d(OR^7)_e(OR^8)(OR^9)]_z$$

wherein c is 1 or 2; d is 0, 1 or 2; e is 0, 1 or 2; with the proviso that d plus e must be 1 or 2; with the proviso that if c is 1, X must be RO—; and with the proviso that when c is 2, X is either RO— or a group which taken together with the Ti to which it is attached forms a ring having the formula



wherein each of f, g, h and i is 0 or 1, with the proviso that at least one of g, h and i is 1 and that the sum of f, g, h, and i is 2 or 3; and wherein each R is independently selected from C_1 to C_{10} alkyl, C_3 to C_{10} alkenyl, C_7 to C_{10} dioxyalkylene; R^1, R^2, R^4, R^7, each R^{10} and each R^{11} are independently selected from hydrogen, C_6 to C_{10} aryl, C_7 to C_{20} aralkyl, C_1 to C_{20} alkyl, C_3 to C_{20} alkenyl, C_2 to C_{20} oxyalkylene and C_3 to C_{20} oligooxyalkylene, with the proviso that one and only one of R^1 and R^2 is hydrogen; R^5, R^6, R^8 and R^9 are independently selected from the same groups as are R^1, R^2, R^4, R^7, each R^{10} and each R^{11}, except that R^5, R^6, R^8 and R^9 may not be hydrogen, and, in addition, R^5 and R^6 are independently selected from C_1 to C_{10} alkanol, C_2 to C_6 alkandiol, C_7 to C_{10} aralkanol, substituted and unsubstituted C_1 to C_{10} alkyl, substituted and unsubstituted C_3 to C_{10} alkenyl substituted and unsubstituted C_6 to C_{10} aryl, and substituted and unsubstituted C_7 to C_{10} aralkyl, these last four groups being optionally substituted with 1 to 3 carboxylate groups or from 1 to 3 carboxamide group being saturated or unsaturated and having from 1 to 5 carbon atoms; with the proviso that when aromatic carbons are present in any one of R, R^2, R^4, R^7, R^{10} or R^{11}, each of said carbons is optionally substituted with 1 to 2 independently selected halogen atoms.

4,417,010
POLYOL/IMIDAZOLE CURING AGENTS FOR EPOXY RESINS

David A. Shimp, Prospect, Ky., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 346,666, Feb. 8, 1982, abandoned. This application Feb. 2, 1983, Ser. No. 462,834

Int. Cl.³ C08G *59/62, 59/68*

U.S. Cl. 523—466 **11 Claims**

1. A curing agent for polyepoxides comprising a liquid blend of a monoimidazole compound and an aliphatic polyol selected from the group consisting of N,N'-dihydroxyethyl 5,5-dimethyl hydantoin and trimethylpentanediol.

4,417,011
RESIN COMPOSITION FOR BONDING FOUNDRY SAND

Koue Ohkawa, Yokohama; Shin Fujii, Zama, and Takashi Seino, Yokosuka, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 154,930, May 30, 1980. This application Apr. 1, 1983, Ser. No. 474,683

Claims priority, application Japan, Jun. 7, 1979, 54-70621

Int. Cl.³ C08K *3/36*

U.S. Cl. 523—527 **4 Claims**

1. A composition for making cores or molds by bonding foundry sand which is obtained by mixing:

(a) foundry sand;

(b) an unsaturated polyester resin which is substantially tack-free at room temperature and has an acid value of 15 to 100, said unsaturated polyester resin being prepared by polymerizing.

(1) a dicarboxylic acid component containing 10 to 50 mole% of terephthalic acid, an alkyl terephthalate, isophthalic acid or an alkyl isophthalate and 50 to 90 mole % of fumaric acid, and

(2) a glycol component containing at least one of ethylene glycol, trimethylene glycol, neopentyl glycol, hydrogenated bisphenol A or 2,2-di-(4-hydroxypropoxyphenyl) propane, wherein said dicarboxylic acid component (1) and said glycol component (2) being polymerized in a (2)/(1) mole ratio of from 0.9 to 1.15; and

(c) a catalyst, the amount of said catalyst being 0.1 to 10 parts by weight per 100 parts by weight of said unsaturated polyester.

4,417,012
ORGANIC THIOSULPHATES AND THIOSULPHONATES USEFUL AS STABILISING AGENTS FOR RUBBER VULCANISATES

Philippe G. Moniotte, Heron, Belgium, assignor to Monsanto Europe S.A., Brussels, Belgium

Filed Jun. 30, 1982, Ser. No. 393,950

Claims priority, application United Kingdom, Jul. 8, 1981, 8121098; Aug. 13, 1981, 8124716

Int. Cl.³ C08K *5/47, 5/41*

U.S. Cl. 524—83 **25 Claims**

1. A vulcanisable rubber composition comprising a diene rubber, sulphur and vulcanisation accelerator, characterised in that the composition also comprises a stabilizer material which is a compound having the formula

$$MO_2S—S—X'—S—SO_3M \quad (I)$$

or

$$X[—(CH_2)_{n'}CH_2—S—SO_3M]_{n''} \quad (II)$$

where X' represents an alkylene radical or a radical comprising two or more alkylene units, pairs of such units being linked through an oxygen or sulphur atom, rhrough a group —SO_2—, —NH—, —NH_2+—, —N($C_{1\text{-}16}$alkyl)- or —COO—, or through an arylene or cycloalkylene radical, X is the trivalent or tetravalent analogue of X1 and in addition may contain one or more Si groups to link pairs of alkylene radicals, n' has an integral value of at least 1, n'' has the value 3 or 4, and M is a monovalent metal, the equivalent of a multivalent metal, a monovalent ion derived by the addition of a proton to a nitrogenous base, or the equivalent of a multivalent ion derived by the addition of two or more protons to a nitrogenous base.

4,417,013
PIGMENT COMPOSITIONS CONTAINING ACRYLATE COPOLYMERS

Johann Schuster, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

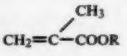
Division of Ser. No. 155,766, Jun. 2, 1980, Pat. No. 4,325,862. This application Jan. 18, 1982, Ser. No. 339,870

The portion of the term of this patent subsequent to Apr. 20, 1999, has been disclaimed.

Int. Cl.³ C08J *3/20;* **C08L** *33/06;* **C09B** *67/00;* **C09C** *3/10*

U.S. Cl. 524—87 **27 Claims**

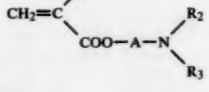
1. A pigment composition comprising an intimate mixture of a pigment and a preformed copolymer of a compound of formula I



I

in which

R is $C_{4\text{-}6}$alkyl or $C_{4\text{-}6}$cycloalkyl, a lesser amount of a compound of formula II



II

in which

R_1 is hydrogen or methyl,

R_2 is hydrogen or C_{1-6}alkyl,

R_3 is C_{1-6}alkyl, or,

R_2 and R_3 together with the nitrogen atom to which they are attached form a heterocyclic 5- or 6-membered ring which may contain an oxygen or a further nitrogen atom, and,

A is a straight or branched chain C_{2-6}-alkylene group,

and 0 to 10%, by weight, of comonomer other than compounds of formulae I and II, said copolymer being in molten form or dissolved in a suitable solvent.

4,417,014
PHTHALOPERINONE DYES AND THE USE THEREOF FOR MORE DYEING PLASTICS

Paul Buecheler, Reinach, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

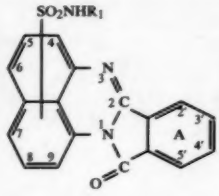
Continuation of Ser. No. 198,625, Oct. 20, 1980, abandoned. This application Aug. 18, 1982, Ser. No. 409,112

Claims priority, application Switzerland, Oct. 25, 1979, 9590/79

Int. Cl.³ C09B 57/12; C07D 487/22

U.S. Cl. 524—90 **22 Claims**

1. A compound of the formula



in which

R_1 is unsubstituted naphthyl or phenyl or phenyl substituted by up to two substituents of which up to two are selected from the group consisting of chlorine, bromine, methyl, methoxy, ethoxy and alkoxy C_{1-2} carbonyl and up to one is selected from the group consisting of nitro, cyano and aminocarbonyl, and

the ring A is unsubstituted or substituted by up to four substituents of which up to four are selected from the group consisting of chlorine and bromine and up to one is nitro.

20. A process for dyeing linear aromatic polyester which comprises incorporating in a molten mass of said polyester or co-condensing with the precursors of said polyester a compound according to claim 1.

4,417,015
LOW TOXIC POLYVINYLCHLORIDE STABILIZERS

Ramchandra K. Hulyalkar, Oakland; Gerald A. Baum, Paramus, both of N.J., and Kanayo Hotchandani, Yonkers, N.Y., assignors to Dart Industries Inc., Northbrook, Ill.

Filed Feb. 6, 1981, Ser. No. 232,108

Int. Cl.³ C08K 5/59, 5/09, 5/36, 15/12

U.S. Cl. 524—139 **12 Claims**

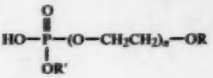
1. A liquid antimony composition, stable under ambient conditions, which consists essentially of:

an antimony organic sulfur-containing compound having the formula

$$R_nSbX_{3-n}$$

where R of the formula is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, cycloalkyl, cycloalkenyl, mixed aryl-alkyl, and substituted groups thereof; where X of the formula is selected from the group consisting of sulfur, SR and SRCOOR'; where R of the group SR is selected from alkyl, aryl, mixed aryl-alkyl, and substituted groups thereof; where R of the group SRCOOR' is selected from alkylene, arylene, aralkylene, and substituted groups thereof; wherein R' of the group SRCOOR' is selected from alkyl, aryl, mixed aryl-alkyl, and substituted groups thereof and where n is an integer of 0 to 2, and

as a stabilizer therefor from about 0.1 to about 5 percent by weight of said compound of an ethoxylated organo-phosphate ester having the formula



wherein R is an alkyl group having a carbon chain length of from 8 to 18 carbon atoms, R' is hydrogen or an alkyl group having a carbon chain length of from 8 to 18 carbon atoms, or a polyethoxylated alkyl or aryl ether such as $(CH_2CH_2O)_n$—OR, and n is an integer from about 2 to about 30.

4,417,016
FROTHING AID COMPOSITION

Charles D. Cline, Fountain Inn, and Thomas L. Mills, Greenville, both of S.C., assignors to Para-Chem Southern, Inc., Greenville, S.C.

Filed Feb. 19, 1982, Ser. No. 350,140

Int. Cl.³ C08K 5/42; C08V 9/30

U.S. Cl. 524—156 **13 Claims**

1. In a frothing aid composition for use in combination with sodium polyacrylate viscosity regulator, the improvement wherein the composition contains from about 1 to 30% by weight of an alkali-soluble thickener comprising a copolymer of acrylic or methacrylic acid with at least one copolymerizable monomer selected from the group consisting of alkyl acrylates or methacrylates having up to 6 carbons in the alkyl, vinylidene aromatic monomers and aliphatic conjugated diene monomers of 4–10 carbon atoms about 70 to 99% by weight of and a surfactant.

4,417,017
POLYMERIC ANTIOXIDANTS PREPARED FROM DIPHENYALMINE AND DIALKYLALKENYLBENZENE OR DIHYDROXYALKYLBENZENE

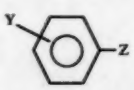
Richard E. Gloth, Copley, and James J. Tazuma, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 26, 1983, Ser. No. 460,977

Int. Cl.³ C08K 5/18

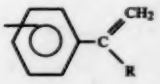
U.S. Cl. 524—255 **10 Claims**

1. A a stabilized polymer composition comprising a polymer derived from an ethylenically unsaturated monomer subject to oxidation having incorporated therein an antioxidant amount of a polymeric diphenylamine compound of randomly distributed repeat units derived from diphenylamine and an additional component, said additional component comprising one or more compounds of structural formula (10)



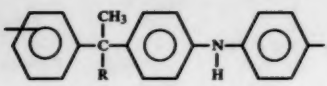
(10)

said polymeric compound containing one or more of structures V, VI and VII:

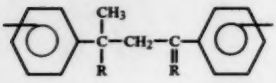


(V)

-continued

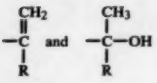


(VI)



(VII)

wherein Y is para or meta relative to Z, Y and Z are the same or different radicals selected from the group consisting of



and R is an alkyl radical of from 1 to 8 carbon atoms; said polymeric diphenylamine compound having a molecular weight between 425 to about 200,000.

4,417,018

FLAME-RETARDANT RESIN COMPOSITION

Yoshinari Ogawa; Noriyuki Akagi, both of Sagamihara; Kenji Ikeda, Tokyo, and Yoichi Nakamura, Hino, all of Japan, assignors to Teijin Limited, Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,231

Claims priority, application Japan, May 25, 1981, 56-78014; Mar. 15, 1982, 57-39364

Int. Cl.³ C08K *5/54*

U.S. Cl. 524—261 **10 Claims**

1. A flame-retardant resin composition comprising (A) a polymer resin comprised of a thermoplastic polyester and 0 to 100 parts by weight of a thermoplastic polycarbonate per 100 parts by weight of the thermoplastic polyester; and per 100 parts by weight of the polymer resin, (B) 0.1 to 30 parts by weight, as the weight of the halogen element, of an organic halogen compound, (C) 0.1 to 20 parts by weight, as the weight of the antimony element, of antimony trioxide surface modified with an alkoxysilane compound of the general formula,

$$R^1—Si-(-OR^2)_3 \text{ or } Si-(-OR^2)_4$$

wherein R^1 is a methyl or phenyl group, and R^2 is an aliphatic hydrocarbon group with 1 to 15 carbon atoms, and (D) up to 30 parts by weight of a carboxylic acid ester composition.

4,417,019

POLYOLEFIN MOLDING COMPOSITION CONTAINING CARBOXYLIC ACID-MODIFIED POLYOLEFIN, GLASS FIBERS AND CALCIUM-SILICATE USEFUL FOR WELDING

Noboru Yamamoto, Tokyo; Keiichi Morikubo, Ooi; Masato Komatsu, Hannou, and Kazuo Sei, Yokohama, all of Japan, assignors to TOA Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1982, Ser. No. 405,495

Claims priority, application Japan, Jul. 9, 1981, 56-139806

Int. Cl.³ C08L *23/26;* **C08K** *7/10, 3/40, 7/14*

U.S. Cl. 524—456 **14 Claims**

1. A molding composition comprising:

(a) at least 50 wt.% of a polymer or copolymer of an alpha-olefin having from 2 to 4 carbon atoms, said polymer or copolymer being modified with an unsaturated carboxylic acid or derivative thereof;

(b) between about 1 wt% and about 30 wt% of glass fiber; and

(c) between about 5 wt% and about 40 wt% of fibrous calcium silicate; the concentration of said glass fibers and fibrous calcium silicate in the modified polyolefin being sufficient to substantially improve the weld tensile strength of the composition when molded.

4,417,020

PIPE COMPOSITIONS CONTAINING ANISOTROPIC MELT-FORMING POLYMERS

Derrick S. Bailey, Welwyn, and Brian P. Griffin, St. Albans, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 3, 1981, Ser. No. 317,854

Claims priority, application United Kingdom, Nov. 7, 1980, 8035800

Int. Cl.³ C08L *27/18, 61/00, 67/04*

U.S. Cl. 524—502 **9 Claims**

1. A composition formed from a blend of a polymer of PTFE and a polymer capable of exhibiting an anisotropic melt characterised in that the composition contains between 20 and 99.5% by weight of PTFE and 0.5 to 80% by weight of the polymer capable of forming an anisotropic melt.

4,417,021

POLYESTER COMPOSITION AND PRODUCTION THEREOF

Katuyuki Nakamura, Nobeoka, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 8, 1981, Ser. No. 252,500

Claims priority, application Japan, Apr. 8, 1980, 55-45954; Nov. 22, 1980, 55-164776; Nov. 22, 1980, 55-164777

Int. Cl.³ C08L *67/02*

U.S. Cl. 524—538 **29 Claims**

1. A polyester composition comprising:

(A) 100 parts by weight of a polyester comprising mainly polyethylene terephthalate and having a reduced specific viscosity (η sp/c) of at least 0.3; and

(B) from 0.05 to 10 parts by weight of at least one polyamide compound having a melting point of at least 300° C. selected from (i) and (ii):

(i) at least one polyamide compound selected from polyamidohydrazides having a structure such that organic groups are linked to each other through amido bonds and hydrazido bonds, polyhydrazides having a structure such that organic groups are linked to each other through hydrazido bonds, and polyamides having a structure such that organic groups are linked to each other through amido bonds wherein organic groups other than aromatic groups are contained therein at least in part; and

(ii) at least one polyamide compound containing an aromatic polyamido moiety comprising at least one of (1) a diamine group represented by the formula (I)

$$—NH—Ar_1—NH— \quad (I)$$

wherein Ar_1 represents a divalent aromatic group;

(2) a dicarboxylic acid group represented by the formula (II)

$$—CO—Ar_2—CO— \quad (II)$$

wherein A_2 represents a divalent aromatic group; and

(3) an aminocarboxylic acid group represented by the formula (III)

$$—NH—Ar_3—CO— \quad (III)$$

wherein Ar_3 represents a divalent aromatic group; linked to each other through amido bonds, and wherein said aromatic polyamido moiety is bound to a polymer other than an aromatic polyamido moiety,

wherein said component (B) is uniformly dispersed in said component (A) in a substantial size of 50 μm or less, and a half width of an exothermic peak of the polyester composition

measured in a crystallization temperature range by a differential scanning calorimeter at a cooling rate of 10° C./min. is 15° C. or less per 8 mg of said component (A).

4,417,022

COATING COMPOSITIONS BASED ON POLYOL-CONTAINING FILM FORMING COMPONENTS AND ORGANIC ALCOHOLIC REACTIVE DILUENTS

Wen-Hsuan Chang; James B. O'Dwyer, both of Gibsonia, and John R. Peffer, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 101,397, Dec. 7, 1979, Pat. No. 4,343,925. This application Apr. 2, 1982, Ser. No. 364,825

Int. Cl.³ C08L *61/22*

U.S. Cl. 524—598 **17 Claims**

1. A coating composition capable of liquid application to a substrate, the vehicle portion of the composition consisting essentially of:

(a) from about 60 percent to about 97 percent of a polyol-containing curable film forming component having a hydroxyl equivalent weight of from about 40 to about 500 and a hydroxyl functionality of at least 2.0, said component being an interpolymer of an unsaturated carboxylic acid amide with at least one other monomer having a

group and characterized in having amido hydrogen atoms replaced by —RCHOR$_1$ wherein R is hydrogen or a saturated lower aliphatic hydrocarbon radical and R$_1$ is hydrogen or a lower alkyl radical; and

(b) from about 3 percent to about 40 percent of an organic reactive diluent capable of chemically combining with the curable film forming component, said reactive diluent having one primary or secondary hydroxyl group and selected from the group consisting of ethers having less than 5 ether groups, amides, esters, urethanes, ureas, sulfur-containing compounds and mixtures thereof, said amides being selected from the group consisting of a product of the reaction of a monoamine with a lactone, a product of the reaction of an alkanolamine with a monocarboxylic acid or its ester, a product of the reaction of a monoamine with a dicarboxylic anhydride followed by reaction with a monoepoxide, and a product of the reaction of an alkanolamine with a dicarboxylic anhydride, and further characterized by having a retained solids value of greater than about 80 percent, a hydroxyl equivalent weight of from about 180 to about 800 and a liquid viscosity of less than about 10 poises at 60° C.

4,417,023

POLYSILOXANE STABILIZERS FOR FLATTING AGENTS IN RADIATION HARDENABLE COMPOSITIONS

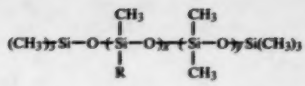
Joseph V. Sinka, Mendham, and Robert A. LieBerman, Hopatcong, both of N.J., assignors to Diamond Shamrock Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 341,301, Jan. 21, 1982, abandoned. This application Feb. 10, 1982, Ser. No. 347,512

Int. Cl.³ C08F *2/48*

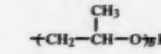
U.S. Cl. 524—731 **2 Claims**

1. In a radiation hardenable composition containing at least one radiation-hardenable oligomer and at least one flatting agent, at least one stabilizer present in an amount sufficient to reduce settling of said flatting agent, said stabilizer being alkylene oxide adducts of siloxane copolymers having the following structure:



where x is about 3, y is about 11, the siloxane backbone has a molecular weight of about 1,000 and constitutes about 20% by weight of the total molecule,

R is —CH$_2$—CH$_2$—O—CH$_2$CH$_2$—O)$_a$



where a and b are present in a ratio of about 1:1, R has a molecular weight of about 1200 and R′ is H.

4,417,024

FLUOROSILICONE-CONTAINING COMPOSITIONS FOR THE TREATMENT OF FIBERS

Yoshinobu Koda, Chiba; Isao Ona, Sodegaura, and Atsushi Takeda, Ichihara, all of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Apr. 9, 1981, Ser. No. 252,677

Int. Cl.³ C08L *83/04*

U.S. Cl. 524—861 **5 Claims**

1. A composition for the treatment of fibers, said cosposition being obtained by mixing components comprising

(A) a siloxane component comprising

(a) a substantially linear organohydrogenpolysiloxane which has at least 5 mol percent of $RQSiO_{2/2}$ units and at least three silicon-atom-bound hydrogen atoms per molecule, wherein R denotes an unsubstituted monovalent hydrocarbon radical having from 1 to 6 carbon atoms and Q denotes a fluorinated monovalent hydrocarbon radical, or

(b) a mixture comprising

(b)(1) a substantially linear organopolysiloxane which consists of from 5 to 100 mol percent of $RQSiO_{2/2}$ units and from 0 to 95 mol percent of $R'R''SiO_{2/2}$ units and which has a silicon-atom-bound hydroxyl at each terminus, wherein R and Q are as denoted above and R′ and R″ denote unsubstituted monovalent hydrocarbon radicals, and

(b)(2) an organohydrogenpolysiloxane which has at least three silicon-atom-bound hydrogen atoms per molecule wherein the organic radicals are unsubstituted monovalent hydrocarbon radicals, and

(B) a curing catalyst component for dehydrogenation condensation between silicon-atom-bound hydrogen atoms or between silicon-atom-bound hydrogen atoms and silicon-atom-bound hydroxyl radicals.

4,417,025

RESIN COMPOSITION EMULSION

Hirotaka Toba, Ohimachi; Masatoshi Mikumo, Kamiitabashi, and Masahiro Asami, Ohimachi, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 6, 1982, Ser. No. 337,335

Claims priority, application Japan, Jan. 13, 1981, 56/3508; Jun. 16, 1981, 56/93647

Int. Cl.³ C08G *59/02*; C08L *1/08*

U.S. Cl. 525—54.21 **13 Claims**

1. An aqueous emulsion of a polymer composition prepared by (1) effecting an intermolecular grafting reaction between a cellulose ester and a first vinyl polymer to obtain a vinyl polymer-grafted cellulose ester, said first vinyl polymer having a molecular weight in the range of from 300 to 200,000 and containing in the molecule at least one functional group selected from the group consisting of epoxy, carboxyl, acid

halide, acid anhydride, isocyanate, active halogen, N-methylol and N-methylol ether, (2) mixing said vinyl polymer-grafted cellulose ester with at least one radical-polymerizable, ethylenically unsaturated monomer, which monomer is adapted to form a second polymer compatible with said first vinyl polymer, whereby to obtain a reaction mixture, and then (3) subjecting said reaction mixture, in an aqueous medium, in the presence of a dispersion stabilizer, to emulsion polymerization effective to polymerize said monomer, in situ, to form said second polymer, and thereby obtain the aqueous emulsion.

4,417,026

THERMOPLASTIC POLYESTER MOULDING COMPOSITIONS HAVING IMPROVED TOUGHNESS

Christian Lindner, Cologne; Rudolf Binsack, Krefeld; Dieter Rempel, and Karl-Heinz Ott, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 9, 1981, Ser. No. 310,147

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1980, 3039115

Int. Cl.³ C08L *51/00*

U.S. Cl. 525—64 **10 Claims**

1. Thermoplastic polyester moulding compositions composed of:

(A) from 60 to 99%, by weight, (based on (A)+(B)) of at least one saturated polyester of an aromatic dicarboxylic acid and an aliphatic or cycloaliphatic diol; and

(B) from 1 to 40%, by weight, (based on (A)+(B)) of a granular graft product composed of:

(I) a cross-linked diene rubber as core;

(II) a cross-linked acrylate rubber as first shell; and

(III) a polymer or copolymer of resin-forming monomers selected from the group consisting of styrene, α-methyl styrene, acrylonitrile, methacrylonitrile, acrylic acid ester, methacrylic acid ester and mixtures thereof as second shell.

4,417,027

RUBBER COMPOSITION FOR SIDE WALL OF TIRE

Masanori Kan, Amagasaki; Takuya Okazaki, Toyonaka, and Tatsuo Sakashita, Suita, all of Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed Jun. 18, 1982, Ser. No. 389,691

Claims priority, application Japan, Jun. 27, 1981, 56-100083

Int. Cl.³ C08L *7/00, 9/00, 9/06, 53/02*

U.S. Cl. 525—99 **1 Claim**

1. A rubber composition for tire side walls comprising:

30–70 parts by weight of solution polymerization star shaped SBR having a glass transistion temperature of less than −50° C., said star shaped SBR further having a styrene content less than 20 percent by weight; and

70–30 parts by weight of a rubber selected from the group consisting of natural rubber, diene synthetic rubber and mixtures thereof, wherein said rubber and said star shaped SBR comprise 100 percent of the polymer material in the composition.

4,417,028

PREAPPLIED PLASTIC FILM ADHESIVE COMPOSITION

Max Azevedo, Wethersfield, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed May 11, 1981, Ser. No. 262,655

Int. Cl.³ C08F *267/04*

U.S. Cl. 525—285 **22 Claims**

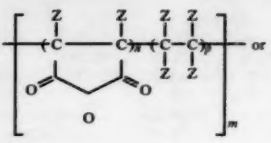
1. An aqueous based adhesive composition, being particularly useful for forming a preapplied adhesive coating or film on parts, especially threaded parts, the composition comprising a dispersion in water of:

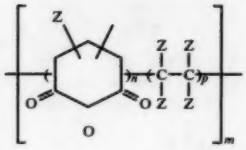
(a) a polymerizable monomer;

(b) a binder at least partly soluble in water;

(c) an initiator; and

(d) an accelerator of polymerization; wherein the binder is a copolymer of the formula:





where Z is selected from the group consisting of: H; C_{1-10} alkyl, alkoxy, alkylene, cycloalkyl; cyano and halo; m is an integer from about 100–1,000; n is greater than 0 but less than 1; and p is 1−n.

4,417,029

DERIVATIZATION OF STAR-BLOCK COPOLYMERS

Ralph Milkovich, Paoli, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 3, 1981, Ser. No. 289,556

Int. Cl.³ C08F *297/04*

U.S. Cl. 525—314 **51 Claims**

1. Star-block copolymers of from 25 to 90% by weight of a monovinyl aromatic compound and 10 to 75% by weight of a conjugated diene of 4 to 8 carbon atoms; said copolymers having at least three arms connected to a polyvinyl aromatic compound nucleus and having polar functional groups attached to said nucleus.

4,417,030

MASS POLYMERIZATION PROCESS FOR ABS POLYBLENDS

Vincent A. Aliberti, Wilbraham; Robert L. Kruse, Belchertown, and Eduardo M. Valcarce, South Hadley, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 265,293, May 20, 1981, abandoned. This application Feb. 12, 1982, Ser. No. 348,474

Int. Cl.³ C08F *279/04*

U.S. Cl. 525—316 **16 Claims**

1. A continuous mass polymerization process for preparing an ABS polymer having a matrix phase comprising a copolymer of a monoalkenyl aromatic monomer and an ethylenically unsaturated nitrile monomer and a dispersed phase comprising rubber particles having a weight average particle size of from about 0.1 to 10 microns, which process comprises:

(i) continuously charging a feed stream of a monoalkenylaromatic monomer having dissolved therein from 3 to 33% by weight of a diene rubber to a stirred reactor;

(ii) simultaneously and continuously charging a separate feed stream of an ethylenically unsaturated nitrile monomer to the stirred reactor;

(iii) both said feed streams being charged to a polymerizing mixture having a polymer solids level above that at which phase inversion occurs and up to about 70% by weight polymer solids based on the weight of the polymerization mixture, the total level of ethylenically unsaturated nitrile monomer in the feed to said mixture being sufficient to provide greater than about 25% by weight polymerized ethylenically unsaturated nitrile monomer in the ABS polymer;

(iv) continuously polymerizing the mixture while maintaining stirring such that the polymerizing mixture has a substantially uniform composition and such that the rubber is dispersed in the polymerizing mixture as rubber particles having a weight average particle size of about 0.1 to 10 microns; and

(v) continuously separating the ABS polymer from the partially polymerizing mixture from step (iv).

4,417,031
PROCESS FOR PREPARING GRAFT AND BLOCK COPOLYMERS

Shaul M. Aharoni, Morris Plains, and Theodore Largman, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 7, 1982, Ser. No. 337,800
Int. Cl.³ C08G *81/00, 81/02*
U.S. Cl. 525—425 **14 Claims**

1. A process for preparing block and/or graft copolymers wherein said process comprises:

a. forming an intimate mixture of two or more polymers selected from the group consisting of polyamides, polyesters, acid homopolymers of alpha beta unsaturated carboxylic acids and acid copolymers of alpha, beta unsaturated carboxylic acids and alpha beta unsaturated olefins, and an effective amount of one or more phosphite compounds of the formula

and symmetrical and asymmetrical diphosphite derivatives thereof; wherein R_1 is alkyl, haloalkyl, or phenyl either unsubstituted or substituted with one or more substituents selected from the group consisting of alkyl, halogen, haloalkyl, nitro, cyano, and isocyanato, with R_2 and R_3 being the same or different and being a metal cation, ammonium cation, hydrogen or R_1; wherein at least one of said polymers includes one or more amino moieties and at least one of the remaining polymers includes one or more carboxylic acid moieties; and

b. heating said mixture for a period of time between about 2 minute and about 30 minutes at a temperature at or above the melting point of said polymers to form said block and/or graft copolymer.

4,417,032
QUASI-RANDOM COPOLYMERS FROM HOMOPOLYMERS

Yash P. Khanna, Morristown; Edith A. Turi, Livingston; Shaul M. Aharoni, Morris Plains, and Theodore Largman, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 22, 1982, Ser. No. 370,885
Int. Cl.³ C08L *77/02*
U.S. Cl. 525—432 **10 Claims**

1. A process for preparing random copolymers which comprises:

a. forming a mixture of poly(caproamide) and poly(hexamethylene adipamide) and a phosphite promoter or combinations of phosphite promoters wherein said phosphite promoters are represented by the formula:

with R_1 being alkyl, haloalkyl, phenyl or phenyl substituted with one or more substituents selected from the group consisting of alkyl, haloalkyl, cyano, nitro, alkylcarbonyl, or isocyanato with R_2 and R_3 being the same or different, and are individually hydrogen, a metal cation, ammonium radical or R_1;

b. heating said mixture at a temperature between about 265° C. and about 315° C. for a period of time between about 2 and about 20 minutes in order to thereby produce a random copolymer having predominantly a single melting transition.

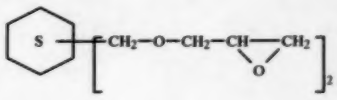
4,417,033
DIGLYCIDYL ETHER OF DIMETHANOL CYCLOHEXANE AND REACTION PRODUCTS THEREOF

W. Raymond Bowditch, West Chester, Pa., assignor to Wilmington Chemical Corporation, Wilmington, Del.

Filed Jun. 1, 1982, Ser. No. 383,480
Int. Cl.³ C08G *59/24*
U.S. Cl. 525—481 **3 Claims**

1. An epoxy resin comprised of the reaction product of:

(a) a diepoxide represented by the structural formula:



(b) a polyfunctional phenolic hydroxy compound represented by the structural formula:

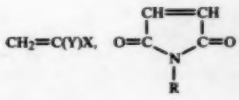
wherein R is an aromatic residue and m is at least 2, and said reaction product is at least difunctional and said difunctionality being epoxide.

4,417,034
LIVING POLYMERS AND PROCESS FOR THEIR PREPARATION

Owen W. Webster, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 279,025, Jun. 30, 1981, abandoned. This application Jun. 17, 1982, Ser. No. 389,110
Int. Cl.³ C08F *4/16*
U.S. Cl. 526—190 **57 Claims**

1. Process of polymerizing the monomer selected from the group consisting of



and mixtures thereof

wherein:

X is —CN, —CH=CHC(O)X′ or —C(O)X′;

Y is —H, —CH_3, —CN or —CO_2R, provided, however, when X is CH=CHC(O)X′, Y is —H or —CH_3;

X′ is —OSi(R^1)$_3$, —R, —OR or —NR′R″;

each R^1 is independently selected from C_{1-10} alkyl and C_{6-10} aryl or alkaryl;

R is C_{1-20} alkyl, alkenyl, or alkadienyl; C_{6-20} cycloalkyl, aryl, alkaryl or aralkyl; any of said groups containing one or more ether oxygen atoms within aliphatic segments thereof; and any of all the aforesaid groups containing one or more functional substituents that are unreactive under polymerizing conditions; and

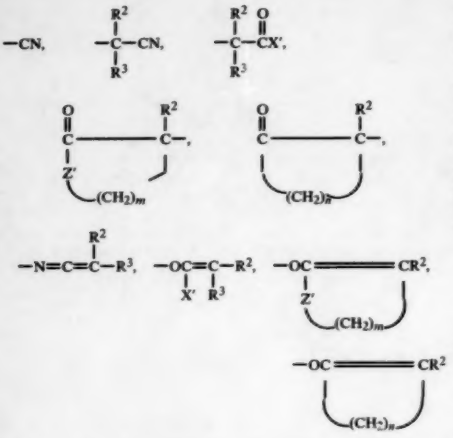
each of R′ and R″ is independently selected from C_{1-4} alkyl

by contacting the one or more monomers under polymerizing conditions with:

(i) the initiator of the formula $(R^1)_3MZ$ wherein:

R^1 is as defined above;

Z is an activating substituent selected from the group consisting of



and mixtures thereof wherein:

X' is as defined above;

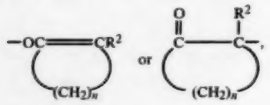
each of R^2 and R^3 is independently selected from H; C_{1-10} alkyl and alkenyl; C_{6-10} aryl, alkaryl, and aralkyl; any of said groups except H containing one or more ether oxygen atoms within aliphatic segments thereof; and any of all the aforesaid groups except H containing one or more functional substituents that are unreactive under polymerizing conditions; and

Z' is O or N;

m is 2, 3 or 4;

n is 3, 4 or 5; and

M is Si, Sn, or Ge, provided, however, when Z is



M is Sn or Ge; and

(ii) a co-catalyst which is a source of fluoride, cyanide or azide ions or a suitable Lewis acid, to produce "living" polymer having repeat units of the one or more monomers.

4,417,035

EMULSIFIABLE HARD WAXES CONSISTING OF COPOLYMERS OF ETHYLENE WITH UNSATURATED CARBOXYLIC ACIDS

Dieter Oeder, Weisenheim; Wolfram Dietsche, Frankenthal; Stefan Weiss, Neckargemuend; Walter Ziegler, Edingen-Neckarhausen; Peter Kueppers, Frankenthal, and Albert Hettche, Hessheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Nov. 13, 1981, Ser. No. 320,976

Int. Cl.³ C08F *212/02, 220/06*

U.S. Cl. 526—208 **1 Claim**

1. A water-emulsified hard wax comprising a homogeneous copolymer of ethylene with about 2.5 to 5% by weight, based on copolymer, of acrylic acid or methacrylic acid and having the following characteristics:

Melt index = 1,500 to 20 MPI units, measured at 160° C. under 325 g load

Acid number = 20–35

Hoppler hardness = 450–650 bar, measured at 23° C. by DGF standard method M-III 9a (57),

prepared by continuous copolymerization of ethylene with acrylic or methacrylic acid in the presence of a free radical initiator at about 150° to 300° C. under a pressure of from 1,000 to 3,000 bar, using a weight ratio of ethylene to acid of about 500:1 to 20:1, in a single-phase polymerization medium in which ethylene is present in supercritical state and acts as a solvent and in the presence of about 0.01 to 5% by weight, based on total monomers, of a regulator selected from the group consisting of an aliphatic aldehyde of 3–6 carbon atoms and an aliphatic ketone of 3–6 carbon atoms, thereby converting from about 3 to 25% by weight of ethylene and continuously removing the copolymer formed therefrom.

4,417,036

PROCESS FOR THE POLYMERIZATION OF CHLOROPRENE

Wilfried Nolte, Leverkusen, and Heinz Esser, Burscheid, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 356,019

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111138

Int. Cl.³ C08F *2/22*

U.S. Cl. 526—211 **6 Claims**

1. A process for the polymerisation of chloroprene, which may contain up to 50%, by weight, of a copolymerisable monomer, in aqueous alkaline emulsion containing emulsifiers and other conventional auxiliaries, polymerisation being carried out to a conversion of more than 80%, characterised in that the emulsion used contains from 0.1 to 2%, by weight, based on the quantity of monomers, of a primary or secondary hydroxyalkylamine in which the OH-group is separated from the amino nitrogen atom by at least two carbon atoms.

4,417,037

VINYL ACYLANHYDROCITRATES AND THEIR PREPARATION

Hans-Ferdinand Muisers; Dieter Arlt, both of Cologne; Manfred Jautelat, Burscheid; Heinrich Alberts, Odenthal, and Fritz Mietzsch, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

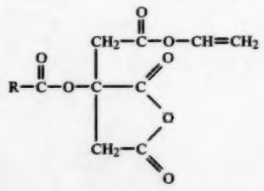
Filed Jan. 18, 1983, Ser. No. 458,793

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204127

Int. Cl.³ C08F *18/14, 118/14;* C07D *307/32*

U.S. Cl. 526—271 **16 Claims**

1. A vinyl acylanhydrocitrate of the formula



in which

R denotes hydrogen or lower alkyl.

4,417,038

ETHYLENE-ALKYNE COPOLYMERS, THEIR PREPARATION AND THEIR USE AS ADDITIVES TO PETROLEUM DISTILLATES

Hans-Henning Vogel, Frankenthal; Manfred Schramm, Viernheim; Michael Werner, Mannheim, and Erich Schwartz, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 4, 1981, Ser. No. 327,727

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046802

Int. Cl.³ C08F *210/02, 238/00*

U.S. Cl. 526—285 **4 Claims**

1. An ethylene-alkyne copolymer, useful as an additive for petroleum distillates, which has a number-average molecular weight, determined by vapor phase osmometry, of from 500 to 500,000 and which contains, as copolymerized units,

(A) from 70 to 99% by weight of ethylene and

(B) an acetylenically unsaturated compound of the general formula (I)

$$H-C\equiv C-R^1 \qquad I$$

where R^1 is $(OCH_2CH_2)_nH$ or CH_2-R^2, n is 1-20, R^2 is —OH, —$OCOR^3$ or —$COOR^3$ and R^3 is a straight-chain or branched C_1-C_{10}-alkyl.

4,417,039

CIS-ENYNE AROMATIC AND AROMATIC HETEROCYCLIC POLYMERS

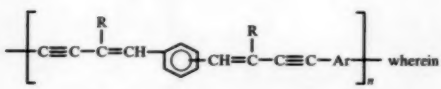
Bruce A. Reinhardt, New Carlisle, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 19, 1982, Ser. No. 399,661

Int. Cl.³ C08F *38/04*

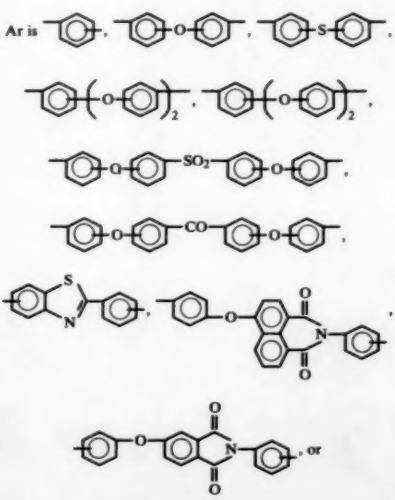
U.S. Cl. 526—285 **16 Claims**

1. A polymer having repeating units of the general formula:



wherein

Ar is



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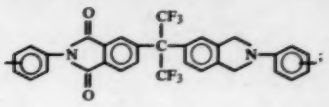


and R is —H or

4,417,040

ANAEROBICALLY CURABLE SEALING COMPOSITION

Yasuhumi Okamura; Aritatsu Masaoka, and Kazutaka Kishita, all of Hachioji, Japan, assignors to Three Bond Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1981, Ser. No. 320,777

Claims priority, application Japan, Nov. 13, 1980, 55-160032

Int. Cl.³ C08F *4/36, 20/20*

U.S. Cl. 526—323.1 **2 Claims**

1. In an anaerobically curable sealing composition comprising a polymerizable monomer (A) consisting of an acrylic ester or a methacrylic ester, and a (B) polymerization initiator, an improvement wherein the said polymerization initiator comprises 3,6,6,9,9-penta-methyl-3-n-butyl-1,2,4,5-tetra-oxacyclononine, thereby to provide the obtained composition better anaerobic characteristics and storage stability.

4,417,041

PROCESS FOR SHAPING SOLID POLYBUT-1-ENE AND THE RESULTING SHAPED ARTICLES

Andre Kepes, Le Vesinet; Eric Weynant, Golfe Juan; Pierre Avenas, Sceaux, and Jean-Marc Haudin, Antibes, all of France, assignors to Societe Chimique des Charbonnages-CdF Chimie, Mazingarbe, France

Division of Ser. No. 85,949, Oct. 18, 1979, Pat. No. 4,324,756. This application Jan. 13, 1982, Ser. No. 339,160

Claims priority, application France, Oct. 30, 1978, 78 30701

Int. Cl.³ C08F *110/08*

U.S. Cl. 526—348.6 **12 Claims**

1. A press-forged polybut-1-ene shaped article made by a process comprising preheating polybut-1ene in the crystalline form II at a temperature between 20° and 90° C. and then press-forging it under a pressure between 8 and 100 kgf/mm^2 for a period of 1 to 40 seconds into a desired shape.

4,417,042

SCAVENGERS FOR ONE-COMPONENT ALKOXY-FUNCTIONAL RTV COMPOSITIONS AND PROCESSES

John J. Dziark, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Feb. 17, 1982, Ser. No. 349,695

Int. Cl.³ C08G *77/06*

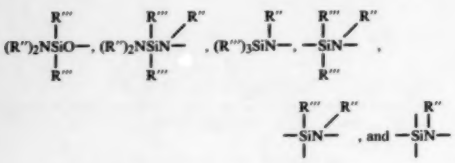
U.S. Cl. 528—18 **90 Claims**

1. A stable, one-package, substantially anhydrous and substantially acid-free, room temperature vulcanizable organopolysiloxane composition stable under ambient conditions in the substantial absence of moisture over an extended period of time and convertible to a tack-free elastomer comprising: (1) an organopolysiloxane wherein the silicon atom at each polymer chain end is terminated with at least 2 alkoxy radicals; (2) an effective amount of a condensation catalyst; and (3) a stabilizing amount of silicone scavenger compound for hydroxy functional groups which is a silicon-nitrogen compound selected from the group consisting of

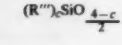
(A) a silicon-nitrogen compound having the formula

where Y is selected from R‴ and R''_2N— and

(B) a silicon-nitrogen polymer comprising (1) from 3 to 100 mole percent chemically combined structural units selected from the group consisting of units having the formula



and (2) from 0 to 97 mole percent chemically combined structural units represented by the formula



where the silicon atoms of said silicon-nitrogen polymer are joined to each other by a member selected from a SiOSi linkage and a SiNR″Si linkage, the free valences of said silicon atoms other than those joined to oxygen to form a siloxy unit and nitrogen to form a silazy unit are joined to a member selected from an R‴ radical and an $(R'')_2N$ radical, and where the ratio of the sum of said R‴ radicals and said $(R'')_2N$ radicals to the silicon atoms of said silicon-nitrogen polymer has a value of 1.5 to 3, inclusive, and R″ is a member selected from the group consisting of hydrogen, monovalent hydrocarbon radicals, and fluoroalkyl radicals, R‴ is a member selected from the group consisting of hydrogen, monovalent hydrocarbon radicals and fluoroalkyl radicals, and c is a whole number equal to 0 to 3, inclusive.

4,417,043

ANISOTROPIC MELT-FORMING POLYMER

Frederic N. Cogswell, Welwyn Garden City; Brian P. Griffin, St. Albans, and Clive P. Smith, Wheathampstead, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jan. 5, 1981, Ser. No. 222,685

Claims priority, application United Kingdom, Jan. 24, 1980, 8002476

Int. Cl.³ C08G *63/18, 63/68, 69/44*

U.S. Cl. 528—176 **10 Claims**

1. A polymer which is capable of forming an anisotropic melt characterised in that the polymer has been prepared in the presence of cross-linking reactants whereby the polymer chain includes residues derived from said cross-linking reactants, the residues being present at a concentration which is insufficient to give a fully cross-linked polymer as defined by having a melt viscosity of less than 10^7 Nsec/m^2 when measured using capillary rheometry at a temperature below the decomposition point of the polymer and at a shear stress of 10^4 N/m^2.

4,417,044

PROCESS FOR MAKING POLYETHERIMIDES

Shashi L. Parekh, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

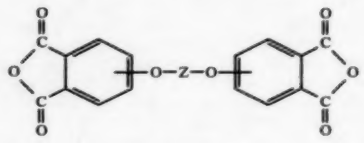
Filed May 25, 1982, Ser. No. 381,859

Int. Cl.³ C08G *73/10*

U.S. Cl. 528—179 **18 Claims**

1. A process for making polyetherimide, which comprises:

(a) reacting an aromatic bis(ether anhydride) of the formula



with an organic diamine of the formula

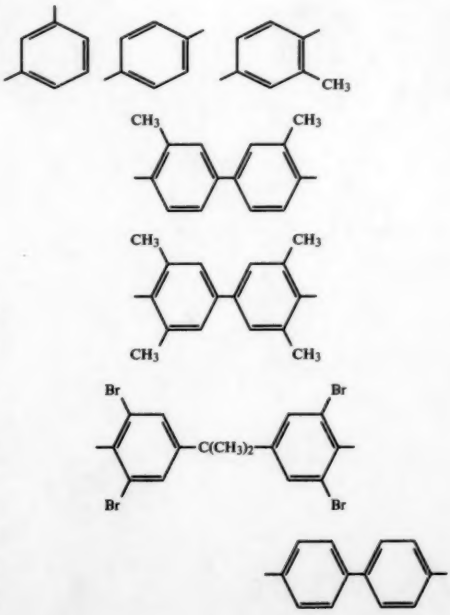
$H_2N\text{-}R\text{-}NH_2$

in an inert solvent under polyetherimide-forming conditions, which include a reaction temperature of from about 40° C. to about 200° C., to form a prepolymer-solvent mixture;

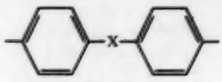
(b) forming a thin film of the prepolymer-solvent mixture under solvent-volatilizing conditions, which includes a temperature of from about 200° C. to about 450° C., to effect substantially complete removal of solvent and water of reaction from said mixture to form a prepolymer; and

(c) heating the prepolymer to a temperature above the glass transition temperature of the final polyetherimide product and less than about 450° C. to form the polyetherimide;

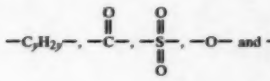
wherein, Z is a member selected from the class consisting of (A) divalent organic radicals having the following formulas



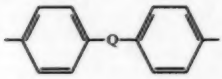
and (B) divalent organic radicals of the general formula



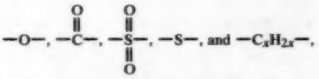
wherein X is a member selected from the group consisting of divalent radicals of the formulas



where y is an integer from 1 to about 5; and R is a divalent organic radical selected from the group consisting of aromatic hydrocarbon radicals having from 6 to about 20 carbon atoms and halogenated derivatives thereof, alkylene radicals having from 2 to about 20 carbon atoms, cycloalkylene radicals having from 3 to about 20 carbon atoms, from C_2 to about C_8 alkylene terminated polydiorganosiloxane, and divalent radicals of the general formula



where Q is a member selected from the class consisting of



and x is an integer from 1 to about 5.

4,417,045

POLYIMIDES AND POLYIMIDE-AMIDES

Tayseer S. Nimry, Wheaton, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

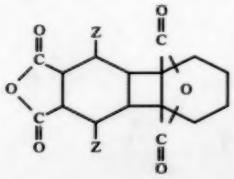
Continuation-in-part of Ser. No. 294,348, Aug. 19, 1981, Pat. No. 4,358,850. This application Sep. 29, 1982, Ser. No. 427,014

The portion of the term of this patent subsequent to Sep. 9, 1999, has been disclaimed.

Int. Cl.³ C08G *73/10, 73/14*

U.S. Cl. 528—188 **16 Claims**

1. A polyimide prepared from an aromatic or aliphatic diamine and the dianhydrides of the following structure:



wherein Z is either hydrogen or a benzene radical and wherein the mole ratio of the aromatic, aliphatic or a mixture of aromatic and aliphatic diamines to the dianhydride is about 1.2:1 to about 1:1.

4,417,046

PROCESS FOR ISOLATING OLIGONUCLEOTIDE PRODUCT FROM A COUPLING REACTION MIXTURE

Hansen M. Hsiung, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 24, 1981, Ser. No. 295,419

Int. Cl.³ C07H *15/12, 17/00*

U.S. Cl. 536—27 **4 Claims**

1. A process for recovering from a reaction mixture polynucleotide product produced by coupling in the presence of a coupling agent (1) a nucleotide or oligonucleotide having a blocked 5'-hydroxyl group and a 3'-phosphate diester group and (2) a nucleotide or oligonucleotide having a blocked 3'-hydroxyl or a blocked 3'-phosphate diester group and a free 5'-hydroxyl group, which comprises adding to the reaction mixture an organic solvent or a mixture of organic solvents comprising a substantially anhydrous ether thereby precipitating polynucleotide product from the reaction mixture while retaining coupling agent in solution.

4,417,047

NOVEL TETRAZOLE-5-THIOL ESTER AND PROCESS FOR PREPARING CEFAMANDOLE USING SAME

Chisei Shibuya, Fuji; Masahiro Murakami, Nobeoka; Masateru Kobayashi, Nobeoka, and Takanori Sone, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

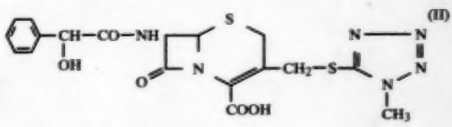
Division of Ser. No. 236,542, Feb. 20, 1981, Pat. No. 4,351,947. This application Feb. 22, 1982, Ser. No. 350,805

Claims priority, application Japan, Mar. 6, 1980, 55-27303; Mar. 7, 1980, 55-28043

Int. Cl.³ C07D *501/04, 501/06*

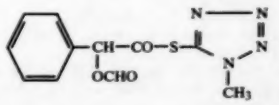
U.S. Cl. 544—26 **12 Claims**

1. A process for preparing a cefamandole having D-configuration in the side chain of the formula:



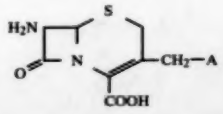
(II)

which comprises reacting a O-formyl-D-(−)-mandeloyl-1-methyl-1H-tetrazol-5-ylthiol ester of the formula:



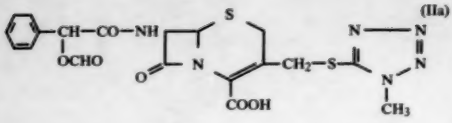
(I)

with a compound of the formula:



(IIIa)

wherein A is a benzimidazol-2-ylthio group or a 1-methyl-1H-tetrazol-5-ylthio group, or its salt to produce a compound of the formula:



(IIa)

or its salt, and treating the compound of the formula (IIa) with an alkaline solution.

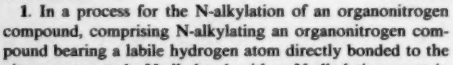
4,417,048

N-ALKYLATION OF ORGANONITROGEN COMPOUNDS

Gerard Soula, Meyzieu, and Maurice Balme, Saint Foy les Lyon, France, assignors to Rhone-Poulenc Specialties Chimiques, Courbevoie, France

Filed Feb. 24, 1982, Ser. No. 351,867
Claims priority, application France, Mar. 11, 1981, 81 04823
Int. Cl.³ C07D *279/22*
U.S. Cl. 544—38 **17 Claims**

1. In a process for the N-alkylation of an organonitrogen compound, comprising N-alkylating an organonitrogen compound bearing a labile hydrogen atom directly bonded to the nitrogen atom to be N-alkylated, with an N-alkylating agent, in the presence of an inorganic base, the improvement comprising conducting said N-alkylation in the presence of a sequestering agent having the structural formula:



(I)

wherein n is a number ranging from 0 to about 10, R_1, R_2, R_3, R_4, which may be identical or different, each represents a hydrogen atom or an alkyl radical having 1 to 4 carbon atoms, and R_5 represents an alkyl or cycloalkyl radical having 1 to 12 carbon atoms, a phenyl radical, or a radical of the formula $-C_mH_{2m}-\phi$, or $C_mH_{2m+1}-\phi-$, m ranging from 1 to about 12 and ϕ being phenyl.

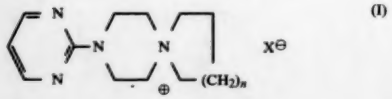
4,417,049

SPIRO-QUATERNARY AMMONIUM HALIDES AND N-(2-PYRIMIDINYL)PIPERAZINYLALKYLAZASPIROALKANEDIONE PROCESS

Jack C. Sims, deceased, late of Elberfeld, Ind., by Donald R. Balser, administrator, assignor to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 197,416, Oct. 16, 1980, Pat. No. 4,351,939. This application Jul. 19, 1982, Ser. No. 399,599
Int. Cl.³ C07D *401/14, 487/10, 471/10*
U.S. Cl. 544—231 **5 Claims**

1. A compound of Formula I



(I)

wherein
n is 1 or 2; and
X is chlorine, bromine or iodine.

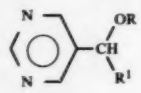
4,417,050

FUNGICIDAL, HERBICIDAL AND PLANT GROWTH-REGULATING PYRIMIDYL-CONTAINING ETHERS

Richard E. Cherpeck, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 23, 1981, Ser. No. 323,833
Int. Cl.³ C07D *239/26;* A01N *43/54*
U.S. Cl. 544—335 **8 Claims**

1. A compound of the formula:



wherein R is aryl of 6 to 10 carbon atoms; aryl of 6 to 10 carbon atoms substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, iodo, nitro, lower alkoxy, lower alkyl or lower alkyl substituted with 1 to 5 of the same or different halogens; arylalkyl of 7 to 12 carbons; arylalkyl of 7 to 12 carbons substituted on the aryl ring with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, iodo, nitro, lower alkoxy, lower alkyl, or lower alkyl substituted with 1 to 5 of the same or different halogens; biphenyl; biphenyl substituted with 1 to 6 of the same or different substituents selected from fluoro, chloro, bromo, iodo, nitro, lower alkoxy, lower alkyl or lower alkyl substituted with 1 to 5 of the same or different halogens; biphenylalkyl of 13 to 18 carbons; biphenylalkyl of 13 to 18 carbons substituted in the biphenyl rings with 1 to 5 of the same or different substituents selected from fluoro, chloro, bromo, iodo, nitro, lower alkoxy, lower alkyl, or lower alkyl substituted with 1 to 5 of the same or different halogens; or CH_2R^2 wherein R^2 is lower alkenyl, lower alkenyl substituted with lower alkoxy or with 1 to 5 of the same or different halogens; lower alkynyl; lower alkynyl substituted with lower alkoxy or with 1 to 5 of the same or different halogens; R^1 is aryl of 6 to 10 carbons; aryl of 6 to 10 carbons substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, iodo, nitro, lower alkoxy, lower alkyl, lower alkyl substituted with 1 to 5 of the same or different halogens; biphenyl or biphenyl substituted 1 to 6 of the same or different substituents selected from fluoro, chloro, bromo, iodo, nitro, lower alkoxy, lower alkyl or lower alkyl substituted with 1 to 5 of the same or different halogens.

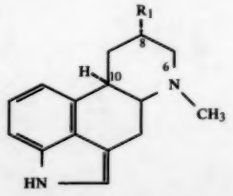
4,417,051

PROCESS FOR THE PREPARATION OF 8α-SUBSTITUTED 6-METHYLERGOLINES

Gerhard Sauer, Berlin, Fed. Rep. of Germany, assignor to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed May 12, 1981, Ser. No. 262,872
Int. Cl.³ C07D *519/02*
U.S. Cl. 546—67 **14 Claims**

1. A process for preparing an 8α-substituted 6-methyl-10α-H-ergoline of the formula



wherein R_1 is NH—CO—NX_2 (wherein X is hydrogen, methyl or ethyl), CO—NH—NX_2, CO—NX_2, or CH_2OX, comprising

reducing the corresponding isolysergic compound, 8α-substituted-9,10-didehydro-6-methylergoline, with an alkali metal or alkaline earth metal dissolved in a nitrogen compound which is a C_{1-3}-alkylamine, a hexa-C_{1-2}-alkyl-phosphoric triamide or ammonia at a temperature of −70° to −30° C., thereby obtaining essentially only the 8α-substituted, 10α-H compound.

4,417,052
PHENYL-LOWER-ALKYL PIPERIDINES AND PYRROLIDINES

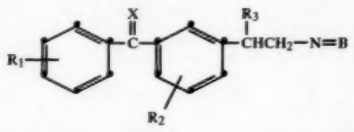
Bernard L. Zenitz, Rensselaer, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 121,836, Feb. 15, 1980, Pat. No. 4,308,382, which is a continuation-in-part of Ser. No. 72,067, Sep. 4, 1979, abandoned, which is a division of Ser. No. 902,569, May 3, 1978, Pat. No. 4,216,326, which is a continuation-in-part of Ser. No. 813,167, Jul. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 641,511, Dec. 17, 1975, Pat. No. 4,069,256, which is a continuation-in-part of Ser. No. 542,553, Jan. 20, 1975, abandoned. This application Aug. 10, 1981, Ser. No. 291,262

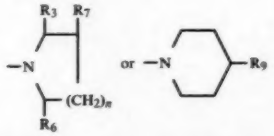
Int. Cl.³ C07D *211/06, 207/04*

U.S. Cl. 546—246 **23 Claims**

1. A member of the group consisting of (A) compounds having the formula:



where R_1 represents hydrogen or from one to two, the same or different, lower-alkyl, hydroxy, lower-alkoxy, trifluoromethyl, lower-alkylmercapto, lower-alkylsulfinyl, lower-alkylsulfonyl or halogen selected from fluorine, chlorine and bromine; R_2 represents hydrogen or lower-alkyl in either of the 2-, 4-, 5- or 6-positions; R_3 represents hydrogen or lower-alkyl; the group >C=X represents >C=O, >C(R₃)OH, >C(R₃)H, >C=CH₂, >C=NOH or >CHN(R₃)₂; and N=B represents one of the groups



where R_6 and R_7 each represent hydrogen, lower-alkyl, cyclohexyl, cyclohexylmethyl, 2-cyclohexylethyl, 3-cyclohexylpropyl or benzyl; R_9 represents lower-alkyl, cyclohexyl, cyclohexylmethyl, 2-cyclohexylethyl, 3-cyclohexylpropyl or benzyl; and n represents one of the integers 1, 2 and 3, and (B) acid-addition salts thereof.

4,417,053
PROCESS FOR THE PREPARATION OF SUBSTITUTED GLYOXYLIC ACID DERIVATIVES

Antonius Corvers, Ubeek; Cornelis W. van den Broek, Schaesberg, and Geertrudes H. Suverkropp, Geleen, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

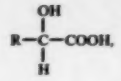
Filed Nov. 12, 1981, Ser. No. 320,562

Claims priority, application Netherlands, Nov. 13, 1980, 8006192

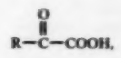
Int. Cl.³ C07C *69/76;* **C07D** *213/50*

U.S. Cl. 546—315 **8 Claims**

1. A process for the preparation of substituted glyoxylic acid derivatives by the oxidation of the corresponding hydroxy derivative, wherein an amide or ester of a hydroxy acid of the general formula:



wherein R represents an (possible substituted) aryl or heteroaryl group, is oxidized in the liquid phase with molecular-oxygen-containing gas, in the presence of a catalytic amount of a cobalt compound, and recovering the corresponding amide or the corresponding ester of glyoxylic acid having the general formula:



from the resulting reaction mixture.

4,417,054
2-(LOWER-ALKOXY)-1-(PYRIDINYL)ETHENYL LOWER-ALKYL KETONES

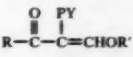
Karl O. Gelotte, Nassau, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed May 24, 1982, Ser. No. 381,162

Int. Cl.³ C07D *213/82, 213/85, 213/50*

U.S. Cl. 546—340 **4 Claims**

1. A 2-(lower-alkoxy)-1-(pyridinyl)ethenyl lower-alkyl ketone of the formula



where R and R′ are each lower-alkyl and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4,417,055
PROCESS FOR PRODUCING A β-TRIFLUOROMETHYLPYRIDINE

Ryuzo Nishiyama, Takatsuki; Kanichi Fujikawa, Moriyama; Isao Yokomichi, Moriyama; Yasuhiro Tsujii, Moriyama, and Shigeyuki Nishimura, Shiga, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

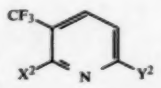
Filed Mar. 9, 1982, Ser. No. 356,528

Claims priority, application Japan, Mar. 27, 1981, 56-44851

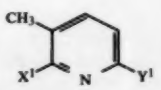
Int. Cl.³ C07D *213/26*

U.S. Cl. 546—345 **10 Claims**

1. A process for producing a pyridine derivative having the formula



wherein X^2 and Y^2 represents hydrogen atom or chlorine atom, which comprises reacting a pyridine compound having the formula



where X^1 and Y^1 represent hydrogen atom or chlorine atom

with chlorine and anhydrous hydrogen fluoride by a vapor phase reaction in the presence of a catalyst at a temperature of 300° C. to 430° C. wherein, the catalyst is a fluoride of a metal selected from the group consisting of copper, vanadium, tin, bismuth, zirconium, magnesium, barium, zinc, calcium, potassium and sodium.

4,417,056

PROCESS FOR PREPARING 2-(4-AMINOPHENYL)-5-AMINO-BENZIMIDAZOLE AND SUBSTITUTED DERIVATIVES

Jean-Marie Cognion, Saint-Genis-Laval, and Pierre Durual, Vernaison, both of France, assignors to P.C.U.K. Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Mar. 11, 1982, Ser. No. 357,108

Claims priority, application France, Mar. 20, 1981, 81 05587

Int. Cl.³ C07D *235/18*

U.S. Cl. 548—334 **11 Claims**

1. In a process for the preparation of 2-(4-aminophenyl)-5-amino-benzimidazole and substituted derivatives thereof by cycloreduction of starting material N-(4-nitrobenzoyl)2,4-dinitroaniline or a substituted derivative thereof by means of hydrogen gas in the presence of a catalyst based on a metal belonging to Group VIII of the Periodic Classification of the elements, the improvement which comprises suspending said starting material in an aqueous solution of hydrochloric acid or phosphoric acid, the content (C) of starting material in said suspension ranging from 0.15 to 1.5 mole per liter and the molar ratio (A): acid/starting material ranging from 2 to 20, said reduction being conducted at a hydrogen pressure from 5 to 100 bars and at a temperature (T) from 20° to 150° C. selected whereby the product $T \times A \times C$ is equal to or greater than 25.

4,417,057

N-SUBSTITUTED IMIDES AND BIS-IMIDES

Dieter Lohmann, Muttenz; Martin Roth, Marly, and Marcus Baumann, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

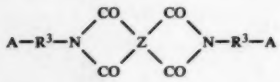
Division of Ser. No. 67,863, Aug. 20, 1979, Pat. No. 4,301,075. This application Jun. 26, 1981, Ser. No. 277,555

Claims priority, application Switzerland, Aug. 30, 1978, 9153/78

Int. Cl.³ C07D *209/94*

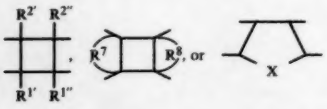
U.S. Cl. 548—429 **7 Claims**

1. A compound of the formula



(II)

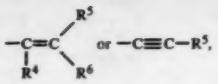
in which Z is a tetravalent radical of the formula



(a) (b) (c)

in which X is —O—, $R^{1'}$, $R^{1''}$, $R^{2'}$ and $R^{2''}$ independently of one another are methyl, phenyl, —CN or chlorine and R^7 and R^8 independently of one another are straight or branched chain alkylene or oxaalkylene having 3–4 C atoms, or said alkylene or oxaalkylene fused with a benzene ring,

A is a group



R^3 is a direct bond, alkylene having 1–8 C atoms, cyclohexylene, phenylene or —CH_2-phenylene with the —CH_2 group bonded to the N atom, R^4 and R^6 independently of one another are hydrogen, methyl or ethyl and R^5 is hydrogen or alkyl having 1–9 C atoms.

4,417,058

TRICYCLIC IMIDYL DERIVATIVES

Hans Zweifel, Basel; Walter Schilling, Himmelried; Angelo Storni, Rheinfelden, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

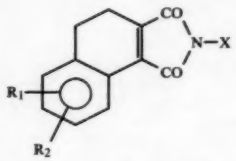
Division of Ser. No. 183,905, Sep. 4, 1980, Pat. No. 4,337,200, which is a continuation-in-part of Ser. No. 9,985, Feb. 6, 1979, Pat. No. 4,242,264. This application Feb. 16, 1982, Ser. No. 349,235

Claims priority, application Switzerland, Feb. 8, 1978, 1400/78

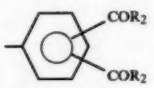
Int. Cl.³ C07D *709/66*

U.S. Cl. 548—451 **6 Claims**

1. A compound of the formula



in which R and R_1 independently of one another are hydrogen, halogen, alkyl having 1 to 4 carbon atoms or methoxy, and X is a group of the formula



the two —COR_2s are bonded to the benzene ring in the meta- or para-position relative to one another and the R_2s are each —OH, —Cl, alkoxy having 1 to 4 carbon atoms or phenoxy, or the two —COR_2s are bonded to the benzene ring in the ortho-position relative to one another and the two R_2s together are —O—.

4,417,059

DIPHENYLAMINO AND INDOLYL SUBSTITUTED PYROMELLITIDES

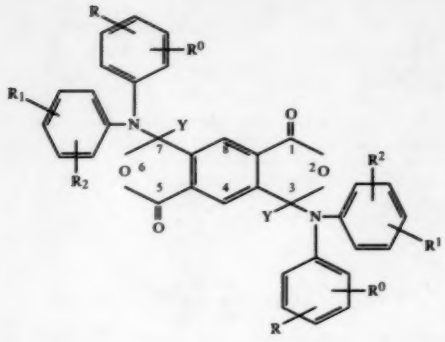
Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 182,717, Aug. 29, 1980, Pat. No. 4,343,493. This application Aug. 19, 1981, Ser. No. 294,375

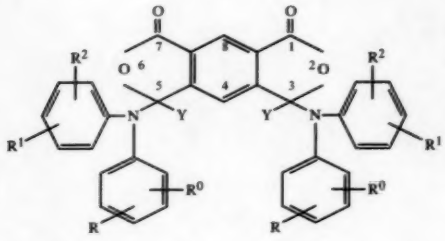
Int. Cl.³ C07D *405/04, 405/14*

U.S. Cl. 548—456 **19 Claims**

1. A compound selected from the group consisting of 3,7-bis-(Y)-3,7-bis[N-(R, R°-phenyl)-N-(R^1, R^2-phenyl)amino]-pyromellitide having the formula



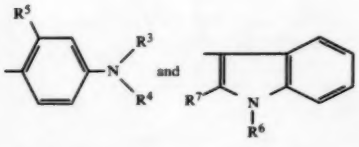
and 3,5-bis(Y)-3,5-bis[N-(R, R°-phenyl)-N-(R¹, R²-phenyl-)amino]pyromellitide having the formula



and mixtures thereof wherein:

R, R°, R¹ and R² are the same or different and are selected from the group consisting of hydrogen, halo, hydroxyl, C_1 to C_4 alkoxy, non-tertiary C_1 to C_9 alkyl, COOZ and NZ^1Z^2 where Z and Z^1 are hydrogen or non-tertiary C_1 to C_4 alkyl and Z^2 is hydrogen, non-tertiary C_1 to C_4 alkyl, C_5 to C_7 cycloalkyl, C_1 to C_4 alkanoyl, phenylsulfonyl or phenylsulfonyl substituted by non-tertiary C_1 to C_4 alkyl;

Y is a radical selected from the group consisting of



in which

R^3 and R^4 are the same or different and are selected from the group consisting of non-tertiary C_1 to C_4 alkyl, benzyl, and benzyl substituted by one or two of halo, C_1 to C_4 alkyl, C_1 to C_4 alkoxy or nitro;

R^5 is selected from the group consisting of hydrogen, non-tertiary C_1 to C_4 alkyl, halo and C_1 to C_4 alkoxy;

R^6 is selected from the group consisting of hydrogen and non-tertiary C_1 to C_{12} alkyl; and

R^7 is selected from the group consisting of hydrogen, non-tertiary C_1 to C_4 alkyl and phenyl.

4,417,060

AMINO-SUBSTITUTED 2-CUMARYL-(3)-CHROMENYLIUM SALTS

Peter Czerney, Weimar; Horst Hartmann, and Jürgen Liebscher, both of Dresden, all of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

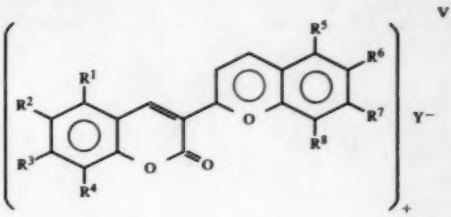
Filed Mar. 26, 1981, Ser. No. 247,954

Claims priority, application German Democratic Rep., Apr. 1, 1980, 220109

Int. Cl.³ C07D 405/14

U.S. Cl. 548—525 **11 Claims**

1. Amino-substituted 2-cumaryl-3'-chromenylium salt of the formula



V

wherein R^3 and R^7 are a dialkyl or cycloalkyl disubstituted amino group, hydrogen, or hydroxy group, provided that at least one of R^3 and R^7 is an amino group, R^1, R^2, R^4, R^5, R^6, and R^8 are hydrogen, an alkoxy group, or two of these substituents together form an aromatic ring, provided that R^1, R^2 and R^4 may be the same or different, and R^5, R^6 and R^8 may be the same or different, and Y^- is an acidic anion.

4,417,061

PHOTOINITIATORS

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 150,974, May 19, 1980, abandoned, which is a continuation of Ser. No. 13,116, Feb. 21, 1979, abandoned, which is a continuation of Ser. No. 833,146, Sep. 14, 1977, Pat. No. 4,161,478, which is a continuation-in-part of Ser. No. 789,419, Apr. 21, 1977, Pat. No. 4,136,102, which is a division of Ser. No. 574,006, May 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 466,374, May 2, 1974, abandoned, Ser. No. 466,375, May 2, 1974, abandoned, and Ser. No. 466,378, May 2, 1974, abandoned. This application Nov. 13, 1981, Ser. No. 320,996

Int. Cl.³ C07F 9/80

U.S. Cl. 549—3 **11 Claims**

1. A sulfonium or selenium salt having an MF_6 anion, where M is selected from the class consisting of phosphorus, arsenic and antimony, where the valence of the sulfonium or selenium salt cation is satisfied by a $C_{(6-12)}$ arylacyl radical and a divalent aliphatic radical.

4,417,062

THIO-BIS-(ALKYL LACTONE ACID ESTERS) AND THIO-BIS-(HYDROCARBYL DIACID ESTERS) ARE USEFUL ADDITIVES FOR LUBRICATING COMPOSITIONS

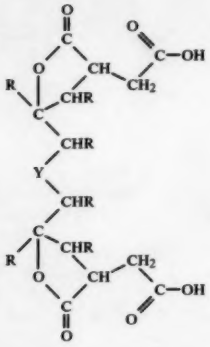
Stanley J. Brois, Westfield, and Antonio Gutierrez, Mercerville, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 954,051, Oct. 23, 1978, Pat. No. 4,239,636, which is a continuation-in-part of Ser. No. 768,265, Feb. 14, 1977, Pat. No. 4,123,373, and a continuation-in-part of Ser. No. 806,326, Jun. 13, 1977, Pat. No. 4,167,514, which is a division of Ser. No. 726,206, Sep. 24, 1976, Pat. No. 4,062,786. This application Jul. 25, 1980, Ser. No. 173,299

Int. Cl.³ C07D *307/32*

U.S. Cl. 549—320 **6 Claims**

1. Thio-bis-(C_4–$C_{10,000}$ alkyl lactone acid) being a compound of the formula



wherein R is selected for the group consisting of hydrogen, hydrocarbyl and substituted hydrocarbyl containing 1 to 10,000 carbon atoms, at least one R having at least 4 carbons, Y is selected from the group consisting of S, S—S, S═O, SO_2, Se, S—$(CH_2)_z$S— where z is a number from 2–10.

4,417,063

PROCESS FOR PREPARATION OF 6,11-DIHYDRO-11-OXODIBENZ[B,E]OXEPINACETIC ACIDS

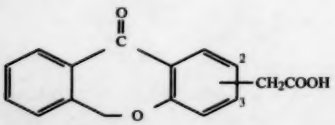
Thomas B. K. Lee, Whitehouse Station; George E. Lee, Somerville, and Gregory M. Jobin, Bridgewater, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed May 18, 1981, Ser. No. 264,482

Int. Cl.³ C07D *313/12*

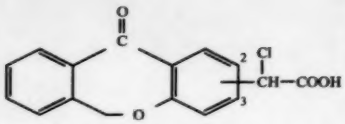
U.S. Cl. 549—354 **10 Claims**

1. A process for the preparation of a compound having the formula



(V)

wherein the -CH_2COOH moiety is in the 2- or 3-position, said process comprising reacting a compound of the formula



(IV)

in solution in an organic solvent with at least one equivalent of hydrogen as a reducing agent, in the presence of a palladium on carbon catalyst and a sufficient amount of a molecular sieve capable of scavenging HCl formed during reaction.

4,417,064

BIPHENYL COMPOUNDS AND METHOD OF PREPARING SAME

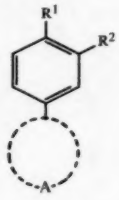
Avinash C. Mehta, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 222,682, Jan. 5, 1981, abandoned. This application Oct. 22, 1981, Ser. No. 313,944

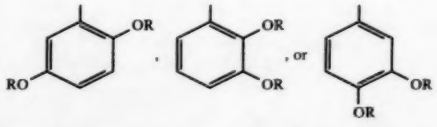
Int. Cl.³ C07D *309/12;* **C07C** *69/017, 43/205*

U.S. Cl. 549—415 **16 Claims**

1. A compound of the formula



wherein one of R^1 and R^2 is hydrogen and the other is $CH_{3-m}X_m$ wherein X is chloro or bromo and m is an integer one or two, and the cyclic moiety A is a -2,5-; -2,3-; or -3,4-di-OR-1-phenyl moiety of the formula



wherein R is a hydroxy-protecting group capable of removal so as to regenerate the hydroxy group.

4,417,065

PROCESS FOR THE PREPARATION OF ISOSORBIDE 2-NITRATE

Peter Stoss, Illertissen, Fed. Rep. of Germany, assignor to Heinrich Mack Nachf. Chem.-Pharmazeutische Fabrik, Illertissen, Fed. Rep. of Germany

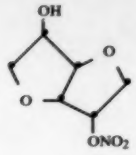
Filed May 24, 1982, Ser. No. 381,124

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1981, 3124410

Int. Cl.³ C07D *493/04*

U.S. Cl. 549—464 **9 Claims**

1. A process for the preparation of isosorbide-2-nitrate of the formula



comprising:

(a) contacting isosorbide with 1 to 2 mole equivalents of carboxylic acid anhydride in the presence of 0.005 to 0.02 mole equivalents of a salt of a metal ion selected from groups 2, 3, 4, 5 or 8 of the periodic system;

(b) esterifying the resultant isosorbide-5-acylate with nitric acid; and

(c) converting the resultant isosorbide-5-acylate-2-nitrate to isosorbide-2-nitrate by treatment with an alkyl alcohol having from 1 to 3 carbon atoms in the presence of an alkali metal alcoholate of 1 to 3 carbon atoms.

4,417,066

SILOXANE QUATERNARY AMMONIUM SALT PREPARATION

Stephen Westall, Barry, Wales, assignor to Dow Corning Limited, Barry, Wales

Filed Sep. 22, 1982, Ser. No. 421,619

Claims priority, application United Kingdom, Oct. 3, 1981, 8129914

Int. Cl.³ C07F 7/10

U.S. Cl. 556—425 **6 Claims**

1. A process for the preparation of organosiloxanes which comprises reacting together (A) a silanol-terminated polydiorganosiloxane wherein at least 50 percent of the total substituents are methyl groups, any remaining organic substituents being monovalent hydrocarbon or fluorinated hydrocarbon groups having from 2 to 20 carbon atoms, and (B) an organosilane represented by the general formula

$$RR'_2Si—Q—N^+X_2YZ^-$$

wherein R represents a group selected from alkyl groups having from 1 to 5 carbon atoms, the phenyl group, a vinyl group and groups as defined for R', each R' represents independently a group having less than 9 carbon atoms selected from alkoxy groups and alkoxyalkoxy groups, Q represents a divalent group having from 1 to 18 carbon atoms the said group being composed of carbon, hydrogen and, optionally, oxygen, any oxygen present being in the form of ether linkages, hydroxyl groups, or both, each X represents independently a group having from 1 to 12 carbon atoms selected from alkyl, aryl, aralkyl and alkaryl groups Y represents a monovalent hydrocarbon group have from 1 to 22 carbon atoms or the group $(—OM)_aOD$, wherein M represents an alkylene group having 2 or 3 carbon atoms, a has a value of from 1 to 20 and D represents a hydrogen atom, an alkyl group or an acyl group, and Z represents a halogen atom.

4,417,067

METHOD OF CLEAVING ORGANOSILOXANES

Hans-Joachim Kötzsch, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Cologne, Fed. Rep. of Germany

Filed Dec. 3, 1982, Ser. No. 446,756

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151677

Int. Cl.³ C07F 7/08, 7/12

U.S. Cl. 556—467 **10 Claims**

1. A method of cleaving a liquid mono- and bifunctional organosiloxane of the formula $(R_3Si)_2O$ or having $[R_2SiO]_x$ units wherein each R represents an identical or different aryl, alkyl, alkenyl, halogen or aryl substituted alkyl, or halogen or aryl substituted alkenyl; and x is the degree of polymerization; by using hydrogen chloride as the cleaving agent and with the formation of organochlorosilanes;

comprising the steps of

reacting the hydrogen chloride with the organosilane at temperatures below 20° C. and at atmospheric pressure;

allowing the hydrogen chloride hydrates formed by the reaction to settle as a bottom liquid phase; and removing the bottom liquid phase from the system.

4,417,068

PROCESS FOR THE ADDITION OF ORGANIC SILICON COMPOUNDS WITH SIH GROUPS TO COMPOUNDS WITH OLEFINIC DOUBLE BONDS

Hans-Joachim Kollmeier, Essen, and Rolf-Dieter Langenhagen, Hattingen Niederwenigern, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Aug. 12, 1982, Ser. No. 407,326

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133869

Int. Cl.³ C07F 7/08, 7/10, 71/8

U.S. Cl. 556—479 **7 Claims**

1. In a process for the addition of silanes or siloxanes having SiH groups and are free of substituents which, after splitting off from the silicon atom, act as proton acceptors, to compounds with olefinic double bonds in the presence of an effective amount of a catalyst of the platinum group, the improvement which comprises said catalysts having the general formula

$$YX_2(NH_3)_2$$

in which

Y is a platinum or palladium radical, and

X is a chlorine, bromine, iodine or the NO_2 group.

4,417,069

METHOD OF PREPARING β-PHENYLETHYLCHLOROSILANES

Edgar D. Brown, Jr., Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,115

Int. Cl.³ C07F 7/08

U.S. Cl. 556—479 **25 Claims**

1. A method for producing β-phenylethylchlorosilanes comprising forming a mixture of styrene, a chlorosilane having at least one hydrogen atom bonded to silicon, a platinum metal or platinum metal complex catalyst and an amount of tertiary amine effective for causing formation of β-phenylethylchlorosilane isomer, and heating the mixture in order to effect addition of the chlorosilane to styrene.

4,417,070

PROCESS FOR PREPARING AN OPTICAL ACTIVE ESTER OF NAPHTHYLPROPIONIC ACID

Kazutaka Arai; Yoshio Ohara; Yasuo Takakuwa, and Toyoko Iizumi, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Apr. 9, 1982, Ser. No. 367,044

Claims priority, application Japan, Apr. 15, 1981, 56-731

Int. Cl.³ C07B 19/00

U.S. Cl. 560—56 **11 Claims**

1. A process for preparing an optical active alkyl ester of α-(6-methoxynaphth-2-yl)propionic acid, which comprises dissolving in at least one organic solvent which is not directly involved in the reaction a racemic modification of an alkyl ester of α-(6-methoxynaphth-2-yl)propionic acid or a mixture containing one of the optical isomers in an amount greater than the other, and seeding seed crystals of one of the optical isomers to effect crystallization for optical resolution.

4,417,071
PHENOLS USEFUL AS STABILIZERS

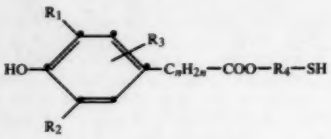
Siegfried Rosenberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 127,015, Mar. 4, 1980, abandoned. This application Mar. 11, 1982, Ser. No. 357,248

Int. Cl.³ C07C *69/88*

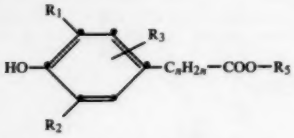
U.S. Cl. 560—67 **8 Claims**

1. A process for the manufacture of a phenol of the formula I



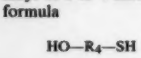
(I)

wherein R_1 is alkyl of 1 to 18 carbon atoms, cycloalkyl, phenyl, aralkyl or chlorine, R_2 is hydrogen or has the same meaning as R_1, R_3 is hydrogen or alkyl of 1 to 12 carbon atoms, R_4 is alkylene of 2 to 18 carbon atoms which is unsubstituted or substituted by aryl or hydroxyl, and n is an integer from 0 to 4, which process comprises transesterifying a compound of the formula II



(II)

wherein R_1, R_2 and R_3 are as defined for formula (I) and R_5 is alkyl of 1 to 4 carbon atoms, with a mercapto alcohol of the formula



wherein R_4 is as defined for formula (I), in the presence of a catalyst of the formula $(R_6O)_4M$, wherein R_6 represents alkyl radicals of 1 to 18 carbon atoms which can be the same or different, aryl or alkaryl, and M is an element selected from the group consisting of Ti, Ge, Zr, Sn or V.

4,417,072
HYDROQUINONE DERIVATIVES AND THEIR USE IN PHOTOGRAPHIC MATERIALS

Stephen R. Postle, Brentwood; Patrick D. P. Thomas, Chelmsford, and Brian R. D. Whitear, Brentwood, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

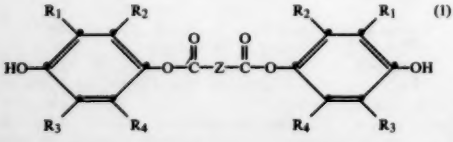
Filed Sep. 29, 1981, Ser. No. 306,846

Claims priority, application United Kingdom, Oct. 2, 1980, 8031742

Int. Cl.³ C07C *69/80, 69/82*

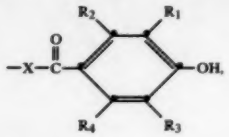
U.S. Cl. 560—86 **6 Claims**

1. A substituted hydroquinone compound of formula



(I)

wherein R_1 to R_4 are each hydrogen or alkyl having from 1 to 4 carbon atoms, Z is an aromatic ring selected from the group consisting of furylene, thienylene, pyrrolylene, pyridinylene or 1,2- or 1,4-phenylene or is a group Z—Y—Z wherein Z is an aromatic ring as defined above and Y is $—SO_2—$, —SO—, —CO— or a group of the formula =PO—A, wherein A is alkyl or alkoxy each having 1 to 4 carbon atoms, phenyl, phenoxy or a group of the formula



wherein R_1 to R_4 and Z are as defined above.

4,417,073
PROCESS FOR THE PREPARATION OF SUBSTITUTED ACETIC ACIDS AND DERIVATIVES THEREOF

Otto Ackermann, Troisdorf, and Gerhard Daum, Cologne, both of Fed. Rep. of Germany, assignors to Dynamit Nobel A.G., Troisdorf, Fed. Rep. of Germany

Filed Nov. 25, 1981, Ser. No. 324,929

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045102

Int. Cl.³ C07C *69/76*

U.S. Cl. 560—105 **15 Claims**

1. A process for the preparation of substituted acetic acids and derivatives thereof, having the formula

(I)

wherein

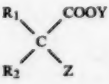
X is —COOH, —COOY or —CN,

Y is $—CH_3$ or $—C_2H_5$,

R_1 is a saturated, branched or unbranched aliphatic radical having from 1 to 6 carbon atoms, a phenyl radical, or a phenyl radical substituted by alkyl or alkoxy groups, and

R_2 is hydrogen or a saturated, branched or unbranched aliphatic radical having from 1 to 6 carbon atoms, a phenyl radical, or a phenyl radical substituted by alkyl or alkoxy groups,

wherein R_1 and R_2 may be the same or different which process comprises converting the corresponding malonic or cyanoacetic ester of the formula



(II)

wherein

Z is —COOY or —CN, and

Y, R_1 and R_2 are identified as above, at a temperature ranging from 150° C. to 360° C. in the presence of a catalyst essentially free of heavy metals except for small amounts of iron oxide impurities and comprising substances of an oxidic or siliceous nature containing at least one of the elements Si and Al.

4,417,074

ALLYLAMINES FROM ALLYL ALCOHOL

Randall J. Daughenbaugh, Longmont, Colo., and Dale D. Dixon, Kutztown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 22, 1981, Ser. No. 313,895
Int. Cl.³ C07C 85/06
U.S. Cl. 564—479 17 Claims

1. A process for preparing allylic amines comprising: contacting an allylic alcohol of the formula $CH_2{=}C(R){-}CH_2OH$ wherein R is hydrogen or methyl with ammonia or an organic amine of the formula R_1R_2NH wherein R_1 and R_2 represent hydrogen or a lower C_1–C_5 hydrocarbyl group in the presence of a catalytically effective amount of a phosphorus containing substance which is not a phosphorus containing ligand complexed with a metal at a temperature sufficient to effect a reaction between the allylic alcohol and the ammonia or organic amine to produce an allylic amine.

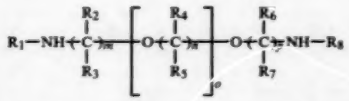
4,417,075

DI-(SECONDARY AND TERTIARYALKYLAMINOALKOXY)ALKANES

Eugene L. Stogryn, Edison, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 18, 1982, Ser. No. 339,899
Int. Cl.³ C07C 93/04; B01D 53/54
U.S. Cl. 564—505 13 Claims

1. A di-secondary aminoether of the general formula:



wherein R_1 and R_8 are each independently selected from the group consisting of primary alkyl having 1 to 8 carbon atoms and primary hydroxyalkyl radicals having 2 to 8 carbon atoms, secondary alkyl and secondary hydroxyalkyl having 3 to 8 carbon atoms, tertiary alkyl and tertiary hydroxyalkyl, cycloalkyl and hydroxycycloalkyl radicals having 3 to 8 carbon atoms, R_2, R_3, R_4, R_5, R_6 and R_7 are each independently selected from the group consisting of hydrogen, C_1–C_4 alkyl and hydroxyalkyl radicals, with the proviso that R_2, R_3, R_6 and R_7 bonded to the carbon atoms directly bonded to the nitrogen atoms are C_1–C_4 alkyl or hydroxyalkyl radicals when R_1 and R_8 are primary alkyl or primary hydroxyalkyl radicals and that at least one of R_2 or R_3 and R_6 or R_7 bonded to the carbon atoms directly bonded to the nitrogen atoms are C_1 to C_4 alkyl or hydroxyalkyl radicals when R_1 and R_8 are secondary alkyl, secondary hydroxyalkyl, or cycloalkyl or hydroxycycloalkyl radicals, m, n and p are positive integers ranging from 2 to 4, and o is either zero or a positive integer ranging from 1 to 10.

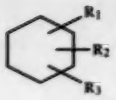
4,417,076

CATALYST AND PROCESS FOR DEHYDROGENATION OF OXYGEN-CONTAINING DERIVATIVES OF THE CYCLOHEXANE SERIES INTO CORRESPONDING CYCLIC KETONES AND/OR PHENOLS

Alexandr Y. Rozovsky, Rublevskoe shosse, 97, korpus 3, kv. 25; Valentin D. Stytsenko, ulitsa Musy Dzhalilya, 34, korpus 2, kv. 18; Svetlana A. Nizova, ulitsa Volgina, 27, kv. 144; Petr S. Belov, ulitsa Vavilova, 52, korpus 3, kv. 163, and Alexandr J. Dyakonov, ulitsa Begovaya, 32, kv. 71, all of Moscow, U.S.S.R.

Division of Ser. No. 223,073, Jan. 7, 1981, Pat. No. 4,363,750. This application Aug. 9, 1982, Ser. No. 406,131
Int. Cl.³ C07C 45/00, 37/06
U.S. Cl. 568—361 2 Claims

1. A process for dehydrogenation of oxygen-containing derivatives of the cyclohexane series of the formula:



wherein R_1 is a radical selected from the group consisting of hydrogen and C_1–C_4 alkyls; R_2 and R_3 are radicals selected from the group consisting of —H, —OH and =O, R_2 and R_3 being not simultaneously hydrogen, R_1, R_2 and R_3 being attached to different carbon atoms of the cycle, into corresponding cyclic organic compounds selected from the group consisting of cyclic ketones, phenols and mixtures thereof comprising contacting said oxygen-containing derivatives of the cyclohexane series of the above formula with a catalyst comprising an active component—nickel, a promoter selected from the group consisting of germanium, lead and mixtures of both, and an inert carrier selected from the group consisting of silica, kieselguhr, silicon carbide and magnesium oxide, the components being present in the catalyst composition in the following proportions, percent by weight:

nickel	15 to 55
promotor	0.2 to 8.0
inert carrier	84.8 to 37.0

and an atomic ratio between nickel and the promoter is from 15:1 to 410:1 respectively; said contacting being effected in the presence of a diluent selected from the group consisting of inert gases, C_1–C_4 aliphatic hydrocarbons, nitrogen, carbon dioxide, steam, aliphatic C_1–C_3 alcohols and different combinations thereof, at a temperature within the range of from 160° to 340° C., under a partial pressure of oxygen-containing derivatives of the cyclohexane series of from 0.003 to 0.1 atm and feed rates of said oxygen-containing derivatives of the cyclohexane series and the diluent equal to 0.5–5.0 kg/l.hr and 1–53 m^3/l.hr respectively.

4,417,077

HETEROGENEOUS ANIONIC TRANSITION METAL CATALYSTS

Russell S. Drago, Champaign, Ill., and Anton El A'mma, Bensalem, Pa., assignors to University of Illinois Foundation, Urbana, Ill.

Division of Ser. No. 192,793, Oct. 1, 1980, Pat. No. 4,328,125, which is a continuation of Ser. No. 38,551, May 14, 1979, abandoned. This application Jan. 26, 1982, Ser. No. 342,689
Int. Cl.³ C07C 45/50
U.S. Cl. 568—454 6 Claims

1. In a process for the catalytic hydroformylation of an olefin to produce the corresponding aldehyde or alcohol which comprises the reaction of an olefinic compound with carbon monoxide and hydrogen at elevated temperatures and pressures in the presence of a transition metal-containing catalyst, the improvement which comprises employing as said catalyst a heterogeneous anionic transition metal catalyst containing a catalytically effective amount of an anionic species having the formula

$$M_n(CO)_m(X)_p^{z-}$$

where M is selected from the transition metal block consisting of rhodium, cobalt, ruthenium, osmium, iridium, and iron; X is an anionic ligand selected from the group consisting of halide, hydride, and alkyl; n ranges from 1 to 12; m ranges from 1 to 34; p ranges from 0 to 2n+1 with the proviso that when n is 1, p is at least 1; and z integer charge ranging from 1 to 5; said anionic species being ionically bound to an insoluble cross-linked anion exchange resin containing a bound quarternary ammonium cation.

4,417,078

PROCESS FOR PRODUCING (+)-4-SUBSTITUTED-2-INDANOLS

John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

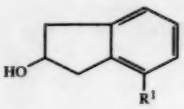
Division of Ser. No. 221,656, Dec. 31, 1980, Pat. No. 4,333,950, and a continuation-in-part of Ser. No. 42,372, May 24, 1979, which is a continuation of Ser. No. 927,198, , which is a continuation of Ser. No. 870,973,. This application May 17, 1982, Ser. No. 378,935

Int. Cl.³ C07C *33/34*

U.S. Cl. 568—808 **5 Claims**

1. A process for producing a 4-substituted-2-indanol of the formula

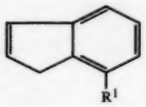
Ia



wherein R^1 is phenyl which may be substituted with halogen or lower alkyl, and the isomer of S configuration at C-2 of the indanyl ring is present in an enantiomeric excess of at least 25% over the isomer of R configuration, which comprises

(i) bringing together (+)-α-pinene and borane in the presence of an ether solvent and at a temperature in the range of about −50° to 35° C., about 2 to 4 moles of (+)-α-pinene being used for each mole of borane employed, to produce an intermediate borane derivative having at least one active hydrogen atom,

(ii) contacting the intermediate borane derivative with a 7-substituted-1H-indene of the formula



wherein R^1 is as defined above, in the presence of an ether solvent and at a temperature in the range of about −50° to 35° C., so as to cause the indene to undergo a hydroboration reaction, and

(iii) contacting the product of step (ii) with hydrogen peroxide in the presence of water and a base selected from sodium hydroxide and potassium hydroxide to produce the 4-substituted-2-indanol of formula Ia.

4,417,079

PROCESS FOR PRODUCING NORMAL-OCTANOL

Noriaki Yoshimura, and Masuhiko Tamura, both of Okayama, Japan, assignors to Kuraray Company, Limited, Kurashiki, Japan

Filed Feb. 10, 1982, Ser. No. 347,558

Claims priority, application Japan, Feb. 16, 1981, 56-21695

The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.

Int. Cl.³ C07C *31/125, 29/17*

U.S. Cl. 568—903 **15 Claims**

1. A process for producing n-octanol which comprises the steps of:

(i) reacting butadiene with water in a solution containing 25–55 wt % water, 5–30 wt % of a carbonate and/or bicarbonate salt of a monodentate tertiary amine having a basicity constant (pKa) of not less than 7, and 30–65 wt % of sulfolane based on the reaction mixture, in the presence of a palladium compound and a hydrophilic monodentate phosphine in an amount of at least 6 moles per gram atom of palladium, to form 2,7-octadien-1-ol;

(ii) extracting 2,7-octadien-1-ol from at least part of the reaction mixture obtained in step (i) with a saturated aliphatic hydrocarbon, a monoolefinic hydrocarbon or an alicyclic hydrocarbon, and recycling the extraction residue to the 2,7-octadien-1-ol synthesis step (i);

(iii) subjecting the extract layer containing 2,7-octadien-1-ol as obtained in step (ii) to distillation at a liquid phase temperature of not higher than about 100° C. to distill off a large proportion of the extracting solvent therefrom, followed by distillation in the presence of water, whereby the extracting solvent remaining is distilled off in the form of an azeotropic mixture with water, to obtain a distillation residue;

(iv) recovering 2,7-octadien-1-ol from the distillation residue obtained in step (iii) by distillation;

(v) hydrogenating the 2,7-octadien-1-ol obtained in step (iv) in the presence of a hydrogenation catalyst to obtain n-octanol; and

(vi) recovering n-octanol from the hydrogenation reaction mixture by distillation.

4,417,080

SOLVENT MODIFICATION OF NITRATIONS BY N_2O_4/METAL ACETYLACETONATE SYSTEMS

David S. Ross, Palo Alto; Robert M. Johnson, Jr., San Mateo, and Ripudaman Malhotra, Menlo Park, all of Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 10, 1982, Ser. No. 386,857

Int. Cl.³ C07C *79/10*

U.S. Cl. 568—939 **16 Claims**

1. In a process for the nitration of an aromatic hydrocarbon, the method for mononitrating benzene which comprises reacting benzene with nitrogen tetroxide in an inert organic solvent containing an effective amount of a metal acetylacetonate at a temperature sufficient to effect nitration.

4,417,081

SELECTIVE 2-CHLORINATION OF META-DIHALOBENZENES

Gerard Soula, Meyzieu, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Sep. 30, 1982, Ser. No. 428,451

Claims priority, application France, Oct. 2, 1981, 81 18585

Int. Cl.³ C07C *17/12*

U.S. Cl. 570—147 **21 Claims**

1. A process for the selective 2-chlorination of a meta-dihalobenzene, comprising reacting such meta-dihalobenzene with a chlorine donor in the presence of at least one alkali metal amide and at least one compound which complexes the cation of such at least one alkali metal amide.

4,417,082

THERMAL TREATMENT OF OLEFIN OLIGOMERS VIA A BORON TRIFLUORIDE PROCESS TO INCREASE THEIR MOLECULAR WEIGHT

John M. Larkin, and Lewis W. Watts, Jr., both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 18, 1982, Ser. No. 389,740

Int. Cl.³ C10L *1/16*

U.S. Cl. 585—10 **29 Claims**

1. A process for oligomerizing mono olefins comprising

a. contacting a mixture of alpha mono olefins which consists essentially of

(1) greater than 50 weight percent of at least one low molecular weight alpha olefin having 4 to 6 carbon atoms and

(2) less than 50 weight percent of at least one higher molecular weight alpha olefin having 8 to 18 carbon atoms,

with a catalyst comprising boron trifluoride at a temperature between about 25° C. and 60° C., and

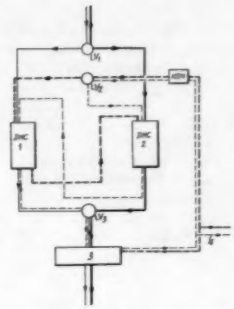
b. subsequently holding the resulting mixture for at least two hours at a temperature between about 60° and 150° C.

4,417,083

PROCESS FOR THE DEHYDROCYCLIZATION OF PARAFFINS AT LOW PRESSURE

Jean-Rene Bernard, Serezin du Rhone, and Michele Breysse, Villeurbanne, both of France, assignors to Elf France, Paris, France

Continuation of Ser. No. 256,087, Apr. 21, 1981, abandoned. This application Dec. 21, 1982, Ser. No. 451,753
Claims priority, application France, May 9, 1980, 80 10411
Int. Cl.³ C10C 5/24, 5/30
U.S. Cl. 585—419 8 Claims



1. A process for the production of aromatic hydrocarbons from petroleum fractions containing paraffins which comprises passing said petroleum fractions, in the presence of hydrogen, at 400° C.–550° C. at a pressure of from about 0.5 to 8 bars absolute, over a catalyst containing from 0.1 to 1.5% by weight of at least one metal selected from the group consisting of platinum, rhenium, iridium, tin and germanium, and containing sulfur in an atomic sulfur/metals ratio of from 0 to less than 1, supported on a crystalline, zeolitic aluminosilicate compensated by alkali metal cations, having a pore dimension larger than 6.5 Angstroms, said catalyst being in a fixed bed in two reactor sets arranged in parallel in a manner such that when a set of reactors (DHC_1) is producing aromatic hydrocarbons, the other set of reactors (DHC_2) is being regenerated by contact with the hydrogen from the first set of reactors (DHC_1) at a temperature sufficient for reactivating the catalyst, and reversing the operation of the reactors.

4,417,084

PREVENTION OF POLYMER FORMATION IN DEHYDROGENATION OF P-ETHYLTOLUENE

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 3, 1980, Ser. No. 126,247
Int. Cl.³ C07C 7/00
U.S. Cl. 585—440 1 Claim

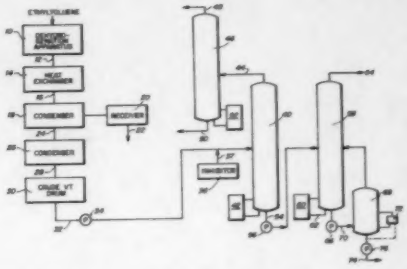
1. In the method for dehydrogenating p-ethyltoluene to p-methylstyrene in the presence of steam at 550°–700° C. by passing a mixture of steam and p-ethyltoluene over a self-regenerative steam dehydrogenation catalyst, the improvement that comprises inhibiting formation of popcorn polymer in the cooling train by continuously adding a minor amount of H_2S to the dehydrogenation effluent entering the cooling train.

4,417,085

PROCESS FOR THE PRODUCTION OF VINYLTOLUENE

James M. Watson; Cleve H. Forward, and James R. Butler, all of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Apr. 2, 1981, Ser. No. 250,413
Int. Cl.³ C07C 5/36
U.S. Cl. 585—440 5 Claims



1. A process for the production of vinyltoluene, comprising the steps of:

producing a crude vinyltoluene product by the catalytic dehydrogenation of ethyltoluene;

selectively removing hydrocarbon compounds from the vinyltoluene product which have more than 11 carbon atoms and which foster the conversion of vinyltoluene into cross-linked polymer to form a prepurified crude vinyltoluene product, the hydrocarbon compounds selectively removed by subjecting the crude vinyltoluene product to flash distillation to form a vaporous prepurified crude vinyltoluene product;

and fractionally distilling said prepurified crude vinyltoluene product in a distillation apparatus to recover purified vinyltoluene.

4,417,086

EFFICIENT FLUIDIZED OLIGOMERIZATION

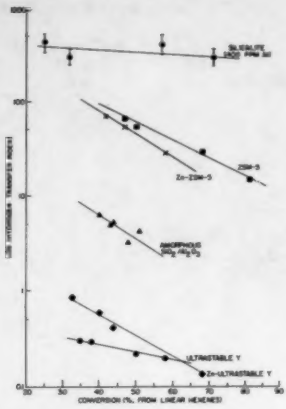
Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 30, 1982, Ser. No. 373,478
Int. Cl.³ C07C 2/02
U.S. Cl. 585—530 16 Claims

1. A fluidized oligomerization process, comprising:

contacting a feed, which comprises olefins, with a fluidizable oligomerization catalyst, which comprises an intermediate pore size silicaceous crystalline molecular sieve, in a fluidized reaction zone containing said catalyst, wherein said zone comprises at least a first part into which said feed is introduced and at least a second part into which a stripping gas is introduced, and wherein said catalyst is circu-

lated between said first part and said second part, such that at least part of said olefins are oligomerized in said



first part and at least part of the olefin oligomers so produced are stripped from said catalyst in said second part.

4,417,087

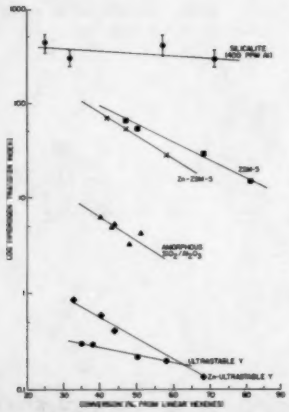
FLUIDIZED OLIGOMERIZATION

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 30, 1982, Ser. No. 373,479

Int. Cl.³ C07C *2/02*

U.S. Cl. 585—530 **15 Claims**



1. A process for oligomerizing olefins comprising:

(a) fluidizing a fluidizable oligomerization catalyst comprising an essentially aluminum-free intermediate pore size silicaceous crystalline molecular sieve having a silica:alumina mole ratio greater than about 200:1 with a feed including gaseous olefins in an oligomerization reaction zone; and

(b) converting at least 30% of said gaseous olefins to higher boiling olefins by maintaining oligomerization reaction zone at oligomerization conditions including a temperature of less than 400° C. and a gas hourly space velocity of said feed sufficient to fluidize at least a portion of said catalyst.

4,417,088

OLIGOMERIZATION OF LIQUID OLEFINS

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 25, 1981, Ser. No. 305,678

Int. Cl.³ C07C *2/02*

U.S. Cl. 585—533 **17 Claims**

1. A process for oligomerizing alkenes, comprising:

(a) contacting under oligomerization conditions a feed comprising one alkene which is a liquid under said oligomerization conditions with a catalyst comprsing an intermediate pore size silicaceous crystalline molecular sieve substantially free of hydrogen transfer activity selected from silicalite, an organosilicate disclosed in Ser. No. RE 29,948 and CZM; and

(b) recovering an effluent comprising oligomerized alkene.

4,417,089

HYDROISOMERIZATION

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 1, 1982, Ser. No. 413,646

Int. Cl.³ C07C *5/25*

U.S. Cl. 585—670 **6 Claims**

1. A process for converting terminal olefins to internal olefins comprising contacting at least one terminal olefin reactant with a catalyst in the presence of hydrogen wherein the catalyst consists essentially of

(a) a palladium component,

(b) a cerium component, and

(c) alumina.

4,417,090

PROCESS FOR THE ISOMERIZATION OF PARAFFINS

Jacobus J. L. Heinerman, and Martin F. M. Post, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1982, Ser. No. 430,470

Claims priority, application Netherlands, Nov. 2, 1981, 8104950

Int. Cl.³ C07C *5/24, 5/30*

U.S. Cl. 585—739 **10 Claims**

1. A process for the isomerization of paraffins, wherein one or more paraffins containing 4–7 carbon atoms is/are contacted with a catalyst in the presence of hydrogen, at a temperature between 150° and 330° C., which catalyst has been prepared by treating an at least partly crystalline metal silicate having a space lattice largely consisting of a triplex structure, containing in the central layer octahedral co-ordinated aluminum entirely or partly substituted by nickel and/or cobalt, and in the two outer layers tetrahedral co-ordinated silicon partly substituted by aluminum, with hydrogen at a temperature of at least 400° C.

4,417,091

PROCESS FOR REMOVING FLUORINE FROM OLEFIN OLIGOMERS

Jean Gaillard, Lyons, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 29, 1982, Ser. No. 373,182

Claims priority, application France, Apr. 29, 1981, 81 08760

Int. Cl.³ C07C *7/12*

U.S. Cl. 585—823 **6 Claims**

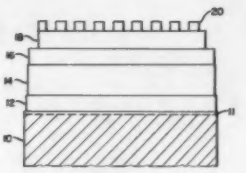
1. A process for removing fluorine from a liquid olefin or from a liquid olefinic cut obtained by dimerizing or trimerizing at least one monoolefin having from 2 to 4 carbon atoms, in the presence of a catalyst obtained by contacting a bivalent nickel compound with a hydrocarbyl aluminum halide and trifluoroacetic acid, said process comprising percolating said olefin or olefinic cut through silica gel at an hourly flow rate of 0.1 to 100 volumes of said olefin or olefinic cut per volume of said silica gel and at a temperature of from −20° to +80° C.

4,417,092

SPUTTERED PIN AMORPHOUS SILICON SEMI-CONDUCTOR DEVICE AND METHOD THEREFOR

Theodore D. Moustakas, Berkeley Heights, and Robert A. Friedman, Milford, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Mar. 16, 1981, Ser. No. 243,754
Int. Cl.³ H01L 31/06, 31/18
U.S. Cl. 136—258 18 Claims



17. A reactively sputtered hydrogenated amorphous silicon PIN photovoltaic device having increased photo-conversion efficiency and longevity, said device comprising:

a substrate having at least a surface region of which comprises an electronconductive material which forms an ohmic contact to n+ doped amorphous silicon;

a reactively sputtered layer of n+-doped hydrogenated amorphous silicon deposited on at least said ohmic contact;

a layer of intrinsic hydrogenated amorphous silicon, reactively sputtered onto said n+ layer;

a layer of p+-doped hydrogenated amorphous silicon ranging in thickness from about 50 to about 150 Angstroms, reactively sputtered onto said intrinsic layer in partial pressures of hydrogen, ranging from about 5×10^{-4} Torr to about 2×10^{-3} Torr, and argon, ranging from about 3×10^{-3} Torr to about 1.5×10^{-2} Torr, said argon containing diborane, B_2H_6; and

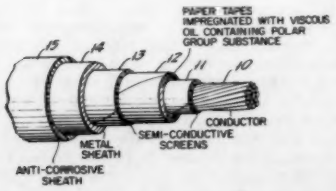
a layer of electroconductive material forming an ohmic contact to said layer of p+doped amorphous silicon, sputter deposited onto at least a portion of said p+-doped layer, said sputtered layers being strongly adherent to contiguous layers and said substrate, said device having a sunlight conversion efficiency in excess of about three percent and further wherein said substrates are maintained during the sputtering of said layers at a temperature ranging from about 250° C. to about 400° C.

4,417,093

HIGH VOLTAGE DIRECT CURRENT CABLE WITH IMPREGNATED TAPE INSULATION

Elio Occhini; Gianmario Lanfranconi, both of Milan, and Piero Metra, Varese, all of Italy, assignors to Societa Cavi Pirelli S.p.A., Milan, Italy

Filed Dec. 4, 1981, Ser. No. 327,353
Claims priority, application Italy, Jan. 14, 1981, 19115 A/81
Int. Cl.³ H01B 7/14, 9/02, 9/06
U.S. Cl. 174—25 R 14 Claims



1. A direct current, electric, submarine cable for an operating voltage of at least 200 kilovolts and adapted for use in lengths of at least 100 kilometers and at substantial depths under water, said cable comprising:

a conductor;

an inner, semi-conductive screen around, and conductively connected to, said conductor;

an outer, semi-conductive screen around and spaced from said inner semi-conductive screen;

a metallic sheath around said outer semi-conductive screen; and

solid insulation intermediate said inner semi-conductive screen and said outer semi-conductive screen; said insulation comprising insulating material which is impregnated with a compound comprising at least a viscous hydrocarbon oil and at least one substance containing polar groups, said compound having a resistivity in the temperature operating range of the cable at least 100 times lower than the resistivity of said insulating material impregnated with said compound;

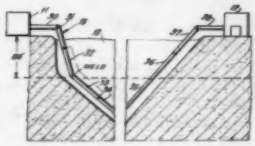
said cable being characterized by a voltage breakdown resistance with voids in the insulation which is greater than the voltage breakdown resistance of the same cable without said compound.

4,417,094

UNDERWATER GAS-INSULATED CABLE WITH PLURAL INTERNAL PRESSURES

Edward M. Spencer, Chalfont, Pa., assignor to Brown Boveri Electric Inc., Rolling Meadows, Ill.

Filed Jun. 21, 1982, Ser. No. 390,274
Int. Cl.³ H02G 5/06, 9/02; H01B 9/06
U.S. Cl. 174—28 12 Claims



1. A multi-pressure cable for transmission of electrical power at extremely high voltage; said cable comprising an elongated tubular central conductor and an outer coextensive sheath which is concentric with said central conductor and which encloses a gas-filled elongated annular volume; a plurality of support insulators spaced along the length of said cable for supporting said central conductor within said sheath; at least first and second adjacent lengths of said cable each adapted to be disposed in different ambient first and second pressures respectively; gas barrier means extending across said annular volume for isolating the portions of said elongated annular volume which are coextensive with said first and second lengths of said cable respectively; and gas at first and second different internal pressures filling the portions of said annular volume which are coextensive with said first and second lengths respectively; said first internal pressure and said

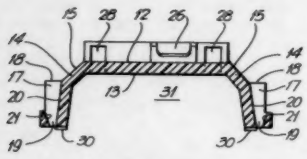
first ambient pressure each being lower than said second internal pressure and said second ambient pressure respectively.

4,417,095

SUPPORT MEMBER FOR ELECTRONIC DEVICES

Roger A. Beun, Dunrobin, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 23, 1981, Ser. No. 314,099
Int. Cl.³ H05K 5/00
U.S. Cl. 174—52 FP 15 Claims



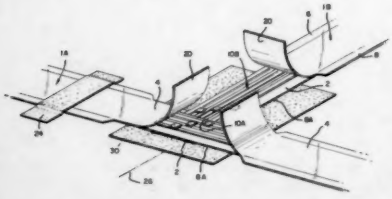
1. A support member for an electronic device, comprising:
a flat central web portion;
a side member extending along opposite sides of said central web portion:
an inclined web connecting a top edge of each side member with the related side of said central web portion, each said inclined web extending upward and inward from the side member to said central web portion;
a plurality of slots extending downward from the top edge of each side member;
a plurality of apertures spaced along a bottom edge of each side member, an aperture aligned with each slot.

4,417,096

METHOD FOR SPLICING A FLAT CONDUCTOR CABLE ENCLOSED WITHIN A SEALED ENVELOPE

Albert D. Willette, Pfafftown, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 228,644, Jan. 26, 1981, Pat. No. 4,319,075. This application Jul. 10, 1981, Ser. No. 282,111
The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.
Int. Cl.³ H01R 43/00
U.S. Cl. 174—71 R 6 Claims



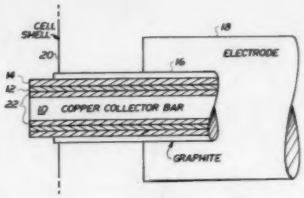
6. A resealed electrical splice of a first and a second flat cable assembly routed along a floor, in which each assembly includes a flat conductor cable and a metal shield layer within a sealed envelope having a top layer and a bottom layer, characterized in that, side margins of each of the assemblies include openings therein, in the first assembly, the shield layer and the top layer are severed transversely, the cables of the assemblies are spliced by electrical terminals, the bottom layers of the assemblies are interleaved, the shield layers and the top layers of the assemblies are interleaved, electrical terminals connect the interleaved shield layers and the interleaved top layers, and flat lengths of adhesive backed tape reseal the openings in the envelope and secure the assemblies to the floor.

4,417,097

HIGH TEMPERATURE, CORROSION RESISTANT COATING AND LEAD FOR ELECTRICAL CURRENT

Subodh K. Das, Apollo, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 4, 1981, Ser. No. 270,509
Int. Cl.³ H01B 7/02; C25C 7/00; B32B 9/04; H01R 3/00
U.S. Cl. 174—110 A 2 Claims



2. A lead for conducting electrical current to or from an electrolytic cell for making aluminum from aluminum chloride, the lead comprising:
an electrically conductive, low electrical resistance lead member adapted to extend into a chamber, the material of the lead member being highly susceptible to corrosive attack by the environment,
a layer of steel located on the lead member,
a first layer of metal disposed on the steel layer, and having a coefficient of thermal expansion that lies between that of the material of the lead member and that of a metal oxide layer disposed on the first layer, and
a layer of metal oxide disposed on the first layer of metal, the metal oxide having (1) a coefficient of thermal expansion somewhat less than the metal layer, and (2) minimum solubility in the chlorine chloride environment, the metal oxide layer being a mixture or combination of any two or all three of the group of oxides consisting of titanium, magnesium and aluminum oxide,
the layers of metal and metal oxide being resistant to corrosive attack by the environment and thereby capable of protecting the lead member from the environment.

4,417,098

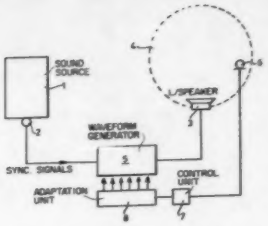
METHOD OF REDUCING THE ADAPTION TIME IN THE CANCELLATION OF REPETITIVE VIBRATION

George B. B. Chaplin, Colchester; Andrew R. Powell, Sheffield, and Roderick A. Smith, Colchester, all of England, assignors to Sound Attenuators Limited, Essex, England

PCT No. PCT/GB80/00128, § 371 Date Apr. 16, 1981, § 102(e) Date Apr. 14, 1981, PCT Pub. No. WO81/00638, PCT Pub. Date Mar. 5, 1981
PCT Filed Aug. 15, 1980, Ser. No. 253,923
Claims priority, application United Kingdom, Aug. 16, 1979, 7928570
Int. Cl.³ H04B 15/00
U.S. Cl. 381—94 9 Claims

1. A method of reducing the amplitude of primary vibration pulses received at a selected location from a source of recurring primary vibration, which method comprises feeding specially synthesised pulses of secondary vibration to said location, the generation of the said pulses of secondary vibration being triggered by a signal derived from the source, and the waveform of the said synthesised pulses of secondary vibration being adapted with respect to the time to improve the extent to which the secondary vibration nulls the primary vibration at the said location, characterised in that the time taken to evolve a successful adaption of the pulses of secondary vibration is reduced by monitoring the pulses of residual vibration at the said location which result from interaction between each primary vibration pulse and the respective pulse of secondary

vibration, and effecting the adaption of the waveform of the pulses of secondary vibration on the basis of the amplitude and/or the polarity of a pulse of the residual vibration cyclically sensed in a plurality of successive time intervals, each separate sensing being used in the derived sequence to control the adaption of a different part of the waveform of a subsequent pulse of the secondary vibration.

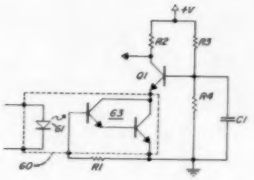


4,417,099

ELECTRO-OPTICAL ISOLATOR CIRCUIT FOR LINE POWERED MODEM

O. Leon Pierce, Huntsville, Ala., assignor to Universal Data Systems, Inc., Huntsville, Ala.

Filed Nov. 3, 1980, Ser. No. 203,110
Int. Cl.³ H03K *3/42*
U.S. Cl. 179—2 DP **3 Claims**



1. A telephone line powered modem comprising:

a transmitter operative in response to binary data from a source to provide modulated data signals to the telephone lines;

a receiver operative to provide binary data signals derived from signals received on the telephone line;

a power source operative in response to telephone line power to provide operating power for the transmitter and receiver while maintaining the current drawn from the telephone line and the voltage drop across the telephone line within specified limits;

output interface means including electro-optic isolators for coupling the binary data signals to be transmitted to the transmitter and for coupling the received binary data signals from the receiver to utilization equipment connected to the modem output,

wherein said electro-optical isolators each include:

a light emitting diode providing light signals in response to applied binary data signals;

a phototransistor pair in light coupling relationship with the light emitting diode and providing a corresponding change in conduction in response to light signals from the light emitting diode; and

a common base amplifier including:

a bipolar transistor;

a collector load connected to the collector of said bipolar transistor for developing an output signal thereacross;

the emitter of said bipolar transistor being connected to said phototransistor which produces a change in the emitter voltage and emitter current according to change in the phototransistor conduction, said change in emitter voltage and emitter current producing a corresponding change in the transistor base current;

resistive base bias means connected to the base of said common base amplifier for providing said base current, and a bias voltage variable according to said base current determined by the phototransistor conduction in response to the received binary light pulses; and

capacitor means for preventing rapid changes in the bias voltage, operative to limit rapid changes in emitter voltage necessary to produce said output signal, wherein,

the resistive base bias means being selected to provide the base voltage and the corresponding emitted voltage to just maintain conduction of the common base amplifier when said photodiode is in the on condition, whereupon

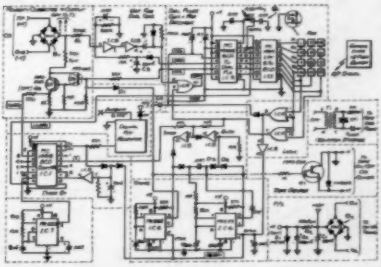
after said binary data causes said light signal to cease, the response time of the corresponding change of said output signal being reduced by an initially limited change in said base voltage according to the capacitor means in combination with said resistor base bias means being operative to limit rapid changes and corresponding said emitted voltage wherein the resulting change in voltage across the phototransistor is minimized.

4,417,100

EMERGENCY DIALER SYSTEM

Alan J. Carlson, Smithtown, and Venerando J. Indelicato, Garden City, both of NY, assignors to Metro-Tel Corp., Syosset, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,529
Int. Cl.³ H04M *11/04*
U.S. Cl. 179—5 R **13 Claims**



1. An emergency dialer system comprising an emergency circuit, means for triggering a start signal to activate said emergency circuit, means in said emergency circuit for automatically dialing a predetermined telephone number to cause the telephone at said predetermined telephone number to ring, means for applying a predetermined emergency signal on the telephone line of said predetermined number, first timing means for applying said emergency signal on said telephone line for a first predetermined time interval, means for connecting a busy circuit to said first timing means to inhibit further triggering of new start signals, said first timing means interrupting the emergency signal at the end of said first predetermined time interval to permit verification of an emergency, said verification interruption being for a second predetermined time interval, means for resuming the automatic dialing if there is no verification within said second predetermined time interval, said automatic dialing and subsequent verification interruption being repeated until verification occurs.

4,417,101

PUBLIC TELEPHONE STATION TRAFFIC ANALYZING ARRANGEMENT

Bernard M. Serres, 51, av. de la Paix, Fresnes, France (94260); Maurice S. Viale, 174, Bd Jean Mermoz, Chevilly-La-Rue, France (94150), and Edouard J. Jewiarz, 13, route de l'Abbaye, Gif-sur-Yvette, France (91160)

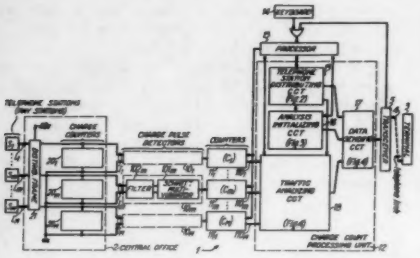
Continuation of Ser. No. 20,188, Mar. 13, 1979. This application Jan. 8, 1981, Ser. No. 223,504

Claims priority, application France, Mar. 14, 1978, 78 07329

The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.

Int. Cl.³ H04M *3/24*

U.S. Cl. 179—8 R **6 Claims**



1. A traffic analyzing arrangement for public telephone stations which are served from a telephone exchange equipped to transmit charging pulses to said telephone stations through telephone subscriber's lines, said arrangement comprising:

means connected in parallel to each telephone line or telephone line input means of said telephone exchange for detecting charging pulses during telephone calls requested by the telephone station connected to said telephone line;

means connected to said charging pulse detecting means for periodically counting the number of detected charging pulses during a predetermined observation period allocated to said telephone station;

first means for storing the address of each telephone station, two predetermined charging pulse number values specific to said telephone station, and a predetermined observation period duration allocated to said telephone station;

second means for storing predetermined average charging pulse numbers of each of said telephone stations during a long observation period;

time recording means connected to said first storing means for determining the end of each observation period and in response thereto, reading-out the charging pulse number in said counting means for resetting said counting means;

means responsive to the reading-out of said charging pulse number for comparing said charging pulse number to said two stored predetermined charging pulse number values specific to said telephone station;

coding means connected to said comparing means for producing a coded signal indicating an operation failure of said telephone station when said charging pulse number is greater than one or less than the other of said predetermined charging pulse number values and for producing another coded signal indicating the normal operation state of said telephone when the charging pulse number lies between said two predetermined charging pulse number values;

changing means connected to said first storing means for changing said predetermined charging pulse number values and said observation period of any telephone station when the average number of charges over a predetermined time of said telephone station has undergone a significant change;

means for displaying the result of the number comparisons in response to a further coded signal transmitted by said coding means;

third means for storing data groups each of said data groups being assigned to telephone stations which have their average charging pulse numbers lying between two predetermined average values and the data of each group being two predetermined average values, two predetermined charging pulse number values specific to said telephone stations of said group and an observation period value;

distributing means connected to said first, second and third storing means for successively comparing said average charging pulse number of each telephone station to two average values of each of said groups thereby distributing in each data group the addresses of the telephone stations which have average charging pulse numbers between said two average value of said group; and

said two predetermined charging pulse number values and said predetermined observation period of each telephone station being those of the data group in which said telephone station is distributed.

4,417,102

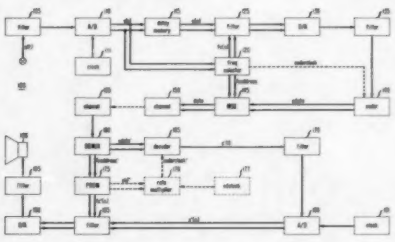
NOISE AND BIT RATE REDUCTION ARRANGEMENTS

Jonathan B. Allen, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 4, 1981, Ser. No. 270,542

Int. Cl.³ G10L *1/00*

U.S. Cl. 364—513 **18 Claims**



1. A method for reducing bandwidth in a digital signal processing system comprising the steps of

partitioning an input signal into a succession of frames,

generating signals representative of the spectral energy of the input signal in each frame,

removing a portion of the input signal spectrum in each frame responsive to the spectral energy signals to form a modified input signal, said removing step comprising, attenuating a portion of the input signal spectrum in each frame corresponding to a predetermined percentage of the total spectral energy in the frame, and

coding the modified input signal.

4,417,103

STEREO REPRODUCTION WITH GAPLESS SPLICING OF PITCH ALTERED WAVEFORMS

William G. Eppler, Jr., Norwalk, Conn.; Michael A. Klasco, New York, and Irwin H. Kornfeld, Brooklyn, both of N.Y., assignors to The Variable Speech Control Company ("VSC"), San Francisco, Calif.

Continuation-in-part of Ser. No. 262,046, May 11, 1981. This application Jan. 31, 1983, Ser. No. 462,230

Int. Cl.³ G10L *1/00*; G11B *31/00*

U.S. Cl. 369—60 **8 Claims**

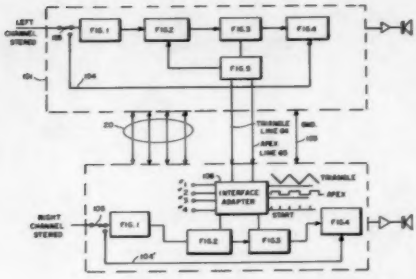
1. A stereo time compression/expansion system in which the playback speed for a recording is selected such that the frequencies of electric signals derived from playback of a recorded work are different than their original values and said

electric signals are processed to change their frequency by periodic variable time delay comprising:

separate processing means for the audio signal for each stereo channel including for each channel:

means for synchronously operating said separate processing means for both said stereo channels to obtain time coincidence between corresponding portions of the said substantially continuous pitch corrected output signal of each stereo channel;

dual variable time delay means for variably delaying said playback signal in response to a control signal;



control signal means for periodically varying said dual delay means inversely with alternate increasing and decreasing delay;

switching means operable for alternately selecting the output of the delay means having the required pitch change during each period of delay variation; and

means for combining the delayed signals detected by said switching means to provide a substantially continuous pitch corrected output signal.

4,417,104

PLUG FOR MINIATURE RECEIVER

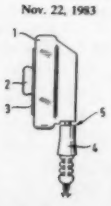
Adolf Langer, Vienna, Austria, assignor to Viennatone Gesellschaft M.B.H., Vienna, Austria

Filed Jul. 15, 1982, Ser. No. 398,666

Claims priority, application Austria, Aug. 14, 1981, 3570/81

Int. Cl.³ H04R *25/00*

U.S. Cl. 179—107 R **3 Claims**



1. Plug for miniature receiver, especially for pocket hearing aids for the hard-of-hearing, with a plug body and at least one pin projecting from the plug body, characterized in that the plug body (7) is provided with a bulge (11, 14) running circumferentially around the plug pin (or pins) (9), of elastic material, which, when the plug is plugged into the receiver (1), acts as a gasket and lies on the receiver housing, whereby it acoustically seals the space between the receiver housing and the plugged in plug.

4,417,105

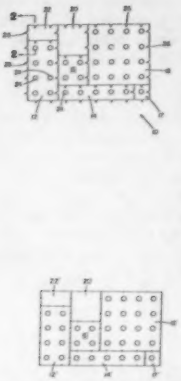
MEMBRANE SWITCH ASSEMBLY WITH MODULAR SWITCH PORTIONS

Nicholas W. Glaser, Jr., Milwaukee, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Oct. 26, 1981, Ser. No. 314,542

Int. Cl.³ H01H *13/70*

U.S. Cl. 200—5 A **4 Claims**



1. A membrane switch assembly comprising a plurality of modular switch portions,

one said modular switch portion including a plurality of switching zones arranged in at least two columns to form rows and columns, the center-to-center distance between adjacent said switching zones in a row and in a column being X, said modular portion having an edge spaced from adjacent said zones by a distance of X/2,

another said modular switch portion having at least one column of switching zones spaced from adjacent zones by X, and having an edge spaced from adjacent said zones by a distance of X/2.

4,417,106

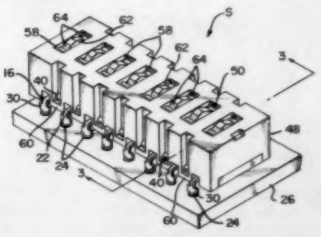
SEALED ELECTRICAL CONTACT ASSEMBLY AND ELECTRICAL SWITCH MADE THEREFROM

David J. Gingerich, Swatara; Patrick R. McCarty, New Cumberland, and David T. Shaffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 2, 1981, Ser. No. 326,723

Int. Cl.³ H01H *19/04*

U.S. Cl. 200—5 R **21 Claims**



1. An actuating mechanism comprising:

housing means having a top, bottom and sides, said housing means having opening means in said top;

actuating means mounted in said housing means;

pivot means on said actuating means and said housing means

pivotally mounting said actuating means for reciprocal movement;

pivot member means on said bottom;

movable member means having embossment means with said embossment means engaging said pivot member means enabling said movable member means to pivot thereabout;

spring biased means mounted in said actuating means engaging said movable member means on one side of said embossment means to maintain said movable member means in one position, to maintain said movable member means in another position when said actuating means moves said spring-biased means to the other side of said embossment means in engagement therewith and urging said pivot means of said actuating means against said housing means to maintain said pivot means of said actuating means and housing means in engagement; and

operating means of said actuating means extending through said opening means of said top for operating said actuating means about said pivot means to move said spring-biased means along said movable member means from the one side of said embossment means to the other side thereof.

4,417,107

SLIDE SWITCH

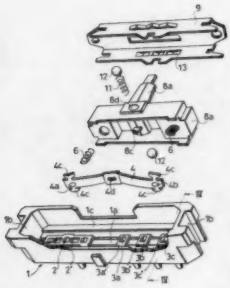
Jiro Terajima, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1982, Ser. No. 349,754

Claims priority, application Japan, Feb. 18, 1981, 56-20727[U]

Int. Cl.³ H01H *15/00*

U.S. Cl. 200—16 C **2 Claims**



1. A slide switch comprising: an insulating substrate; a plurality of stationary contact segments constituting a common stationary contact, and a plurality of switching contact segments arranged in a row on said insulating substrate; a movable contact having movable contact segments adapted to slide in contact with said stationary contact segments; and a groove formed in the lower portion of said insulating substrate so as to extend in the direction of the row of said stationary contact segments, said stationary contact segments each being raised to a height above said groove and straddling said groove, said movable contact segments each being of a width less than that of said groove so that they may fit within said groove to avoid contacting said insulating substrate.

4,417,108

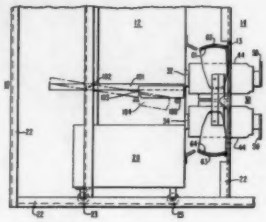
SWITCHGEAR SHUTTER

Ronald E. Vaill, Penn Township, Westmoreland County; Stephen S. Ciccotelli, Pitcairn, and Carl R. Merola, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 16, 1981, Ser. No. 302,880

Int. Cl.³ H01H *9/22*; H02B *1/14*

U.S. Cl. 200—50 AA **12 Claims**



1. Electrical apparatus, comprising:

(a) a housing means;

(b) stationary contact means disposed generally within said housing means;

(c) movable contact means disposed to engage said stationary contact means;

(d) a plurality of curvilinear displaced barrier means, each barrier means having at least two tandem and mechanically cooperating members disposed generally within said housing means having a first serial position for electrically shielding said stationary contact means from any electrical engagement and a second tandem position for allowing engagement of said stationary contact means with said movable contact means; and

(e) actuating means mechanically connected to said movable contact means and to at least one member of each of said plurality of curvilinear displaced barrier means for moving said curvilinear displaced barrier means between said first and second positions when the movable contact means is placed into engagement with the stationary contact means.

4,417,109

SWITCH CONSTRUCTION

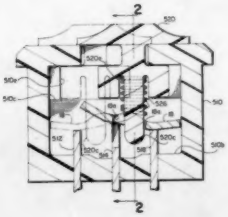
Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.

Continuation-in-part of Ser. No. 234,664, Feb. 11, 1981, Pat. No. 4,347,417. This application Jan. 22, 1982, Ser. No. 341,706

The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.

Int. Cl.³ H01H *5/06*

U.S. Cl. 200—68 **5 Claims**



1. A switch comprising a base of insulating plastic and defining an upwardly open cavity, a plurality of fixed contacts

spaced along the bottom wall of said base cavity, said switch having means defining actuator support regions, actuator means including support means cooperating with said support regions to slidably support said actuator, said actuator means including a depending portion, a movable contact element slidably received inside said switch base cavity for movement generally across the upper ends of certain of said spaced contacts to selectively bridge said certain fixed contacts, spring means retained by said depending actuator portion and engaging said movable contact element to bias said movable element in engagement with said fixed contacts, said movable contact element having at least one upwardly open recess to loosely receive the lowermost end of said depending actuator portion and said movable contact element having portions adjacent said recess for engaging said spring means during actuator movement, whereby said element is moved in response to such actuator movement.

4,417,110

VACUUM INTERRUPTER

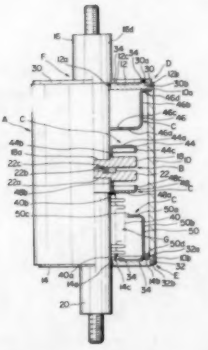
Hifumi Yanagisawa, Sagamihara; Junichi Warabi, Shizuoka, and Shinzo Sakuma, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jul. 16, 1981, Ser. No. 283,867

Claims priority, application Japan, Sep. 21, 1980, 55-99694; Jul. 21, 1980, 55-99696

Int. Cl.³ H01H *33/00*

U.S. Cl. 200—144 B **13 Claims**



1. A vacuum interrupter comprising in combination:

an envelope including a cylindrical housing made of a metallic material, a disc-shaped upper end plate made of an inorganic insulating material having an aperture in the center portion thereof and a disc-shaped lower end plate made of an inorganic insulating material having an aperture in the center portion thereof;

said housing having a different coefficient of thermal expansion from those of said upper and lower end plates;

an electrical contact member including a stationary contact rod inserted into said envelope through said aperture of the upper end plate, a stationary electrical contact secured to said stationary contact rod, a movable contact rod inserted into said envelope through said aperture of the lower end plate and a movable electrical contact secured to said movable contact rod;

shielding means for shielding the inner surface of said envelope and including first and second main shields and first and second auxiliary shields;

first sealing means for sealing hermetically said upper end plate to said housing and including a first sealing member made of a plastically deformable metallic material which is deformable by the thermal stress generated during a cooling process after brazing and a metallized portion provided between said first sealing member and said upper end plate;

second sealing means for sealing hermetically said lower end plate to said housing and including a second sealing member made of a plastically deformable metallic material which is deformable by the thermal stress generated during a cooling process after brazing and a metallized portion provided between said second sealing member and said lower end plate;

first supporting means for supporting and securing hermetically said stationary contact rod to said upper end plate including a metallized portion provided between said upper end plate and said stationary contact rod, said stationary contact rod having different coefficient of thermal expansion from those of said upper and lower end plates; and

hermetic seal means for sealing movably and hermetically said movable contact rod to said lower end plate including a bellows for securing said movable contact rod to said lower end plate and a metallized portion provided between said lower end plate and said bellows;

said first sealing means comprises an end portion of said housing, said first sealing member is secured to said end portion of said housing and an outer peripheral edge portion of said upper end plate secured to said first sealing member via the metallized portion;

said second sealing means comprises another end portion of said housing, said second sealing member is secured to said another end portion of the housing and an outer peripheral edge portion of said lower end plate secured to said second sealing member via the metallized portion.

4,417,111

THREE-PHASE COMBINED TYPE CIRCUIT BREAKER

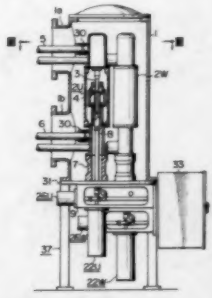
Tuneo Kishi; Yasuhide Takeda; Toru Tsubaki, and Takeshi Takahashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 18, 1981, Ser. No. 235,597

Claims priority, application Japan, Feb. 20, 1980, 55-19122

Int. Cl.³ H01H *33/42*

U.S. Cl. 200—148 R **13 Claims**

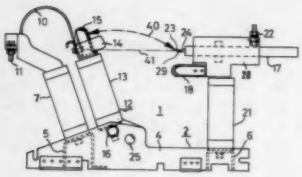


1. A three-phase combined type circuit breaker comprising a common hermetic housing filled with an insulating medium, three-phase interrupting units each having a contact system independently operable within said hermetic housing, three phase operating devices operable independently of each other from outside of said hermetic housing, three-phase link mechanisms for connecting output terminals of said operating devices and operating force input terminals of said interrupting units by phase for operating said contact systems respectively, and three-phase hermetic alloy holding means arranged in a middle portion of each of said link mechanisms respectively for holding the hermetic condition of said hermetic housing while allowing the link mechanisms for respective phases to operate.

4,417,112
LOAD BREAK SWITCH WITH CURRENT QUENCHING DEVICE

Paul Kueenzle; Juergen Krysiak, and Hans-Karl Reuter, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 358,275
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3111793
Int. Cl.³ H01H 33/12
U.S. Cl. 200—146 R 5 Claims

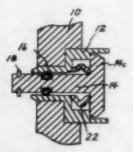


1. In a load break switch of the "swivel post" type, having a fixed electrical contact carried on a stationary post and a movable electrical contact carried on a pivotal switching arm mounted on a switch shaft, and further having a current quenching means to cut off the load current when the switching arm swings into the open switch position, the improvement comprising the quenching means being arranged fixedly as a unit adjacent the fixed contact and including a switch pin mounted for rectilinear displacement and having a ratchet head at its outer end; and the switching arm including a sliding block type driver to which the ratchet head of the switch pin is coupled or uncoupled in dependence on the angular position of the switching arm.

4,417,113
STRUCTURE OF PUSH-BUTTON DEVICE

Motoyuki Saito, and Satoru Fukutome, both of Tanashi, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Feb. 5, 1981, Ser. No. 231,822
Claims priority, application Japan, Feb. 5, 1980, 55-13232[U]
Int. Cl.³ H01H 9/04, 3/12
U.S. Cl. 200—302 5 Claims

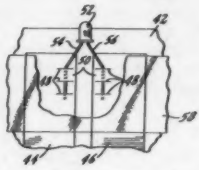


1. A push-button device comprising:
a pipe having a first and a second shoulder;
a button body having a head portion and a shaft portion extending from said head portion, said shaft portion being slidably received in said pipe;
a waterproofing sealing ring disposed between an inner wall of said pipe and the shaft portion of said button body; and
a non-metallic, resilient sleeve disposed between the head portion of said button body and the first shoulder of said pipe, said sleeve serving as means for restoring said button body to its original position and serving as means for preventing entry of dust toward said sealing ring, said second shoulder being engaged by said head portion when the button body is depressed thereby limiting the extent of depression of said resilient sleeve.

4,417,114
CONNECTOR FOR ATTACHING AN ELECTRICAL COMPONENT TO A FLAT SHEET

Willis A. Larson, Crystal Lake, Ill., assignor to Oak Industries Inc., Rancho Bernardo, Calif.

Continuation of Ser. No. 228,319, Jan. 26, 1981. This application Feb. 16, 1982, Ser. No. 348,998
The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.
Int. Cl.³ H01H 9/02
U.S. Cl. 200—317 2 Claims

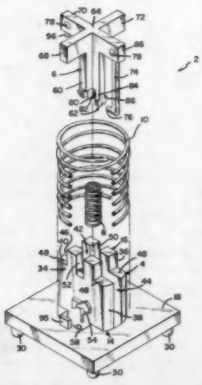


1. A connector for attaching an electrical component to a piece of sheet material including conductive traces formed on the sheet material, at least two slits in the sheet, at least one lead of the electrical component being interlaced through the slits to hold the component on the sheet material, at least one lead of the electrical component being in electrical and mechanical contact with at least one conductive trace formed on the sheet material.

4,417,115
SWITCH ACTUATING ASSEMBLY HAVING IMPROVED CAMS AND PLURAL MODES

Mark R. Desmarais, Derry, and Mark A. Yates, Chelmsford, Mass., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 3, 1982, Ser. No. 354,318
Int. Cl.³ H01H 3/12, 3/00
U.S. Cl. 200—340 13 Claims



1. A switch actuating assembly of the type comprising a frame having a fixed end and a free end, a plunger mounted on the frame, the plunger having a lower end which is proximate to the fixed end of the frame and a force-receiving end which is proximate to the free end of the frame, the plunger being slideably mounted on the frame and being movable from a normal position to a depressed position when force is applied to the force-receiving end, the force-receiving end being located beyond the free end of the frame when the plunger is in the normal position, the force-receiving end being moved towards the free end of the frame and the lower end being

moved towards the fixed end of the frame when the plunger is moved to the depressed position, and spring means which is resiliently stressed when the plunger is moved to the depressed position and which returns the plunger to the normal position when force is removed from the force-receiving end, the switch actuating assembly being characterized in that:

the plunger has a deflectable camming arm connected thereto proximate to the force-receiving end, the camming arm extending towards the lower end of the plunger and having a cam following free end,

a first cam and a second cam are provided on the frame, the first cam and the second cam being between the cam following free end and the fixed end of the frame when the plunger is in the normal position, the first cam and the second cam being spaced apart in an angular sense on the frame,

the plunger being capable of assembly to the frame while the plunger is in first or second angular orientation relative to the frame, the cam following free end of the camming arm being engageable with the first cam when the plunger is assembled to the frame while in the first angular orientation, the cam following free end of the camming arm being engageable with the second cam when the plunger is assembled to the frame while in the second angular orientation,

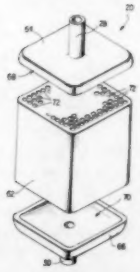
the second cam being contoured to permit movement of the cam following free end of the camming arm therepast when the plunger is moved to the depressed position from the normal position and being contoured to arrest movement of the cam following free end when the plunger is moved from the depressed position to the normal position so that the plunger is held in an intermediate position, the second cam being contoured to permit passage of the cam following free end and return of the plunger to the normal position following movement of the plunger from the intermediate position to the depressed position,

the first cam being contoured to require an abrupt increase in force to depress the plunger and thereby provide a tactile effect to the operator.

4,417,116
MICROWAVE WATER HEATING METHOD AND APPARATUS

Jerimiah B. Black, P.O. Box 31774, 2065 Church Creek Dr., Charleston, S.C.

Filed Sep. 2, 1981, Ser. No. 298,533
Int. Cl.³ H05B *6/78*
U.S. Cl. 219—10.55 A **8 Claims**



1. Apparatus for heating fluid, especially water, utilizing microwave energy comprising:

means for generating microwave energy;

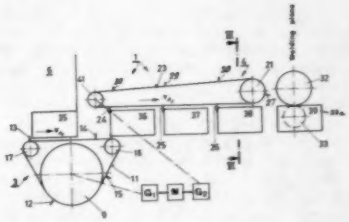
means for defining a microwave chamber for containing the microwave energy generated by said generating means; and

means in said microwave chamber means for conducting the fluid to be heated through the microwave energy, said fluid conducting means comprising a solid unitary block formed of a substantially microwave-transparent material, said block having a plurality of fluid passages extending therethrough, said fluid flowing through said passages directly contacting the microwave-transparent material of the solid unitary block, said block further comprising a pair of end covers formed of a substantially microwave-transparent material and sealingly mounted to respective ends of said unitary block, each end cover having a cavity enclosing the ends of said fluid passages and a conduit extending into said cavity, the total cross-sectional flow area of said fluid passages being at least twice the cross-sectional flow area of each of said conduits whereby the flow velocity through said fluid passages is substantially less than the flow velocity through said conduits.

4,417,117
TRANSPORTING CAN BODIES FOR A FULLY AUTOMATED RESISTANCE WELDING MACHINE

Paul Opprecht, Im hinteren Bernold, 8962 Bergdietikon, Switzerland

Division of Ser. No. 89,209, Oct. 29, 1979, Pat. No. 4,354,086, which is a continuation of Ser. No. 905,477, May 12, 1978, abandoned. This application Jan. 19, 1981, Ser. No. 226,227
Claims priority, application Switzerland, Jun. 10, 1977, 714377
Int. Cl.³ B23K *11/06*; **B65G** *47/31*
U.S. Cl. 219—64 **5 Claims**



1. A method of transporting rolled cans from a roll former station to welding electrodes, comprising the steps of:

providing two transport systems respectively having a first can body transfer device and a second can body transfer device;

driving said first can body transfer device at a varying velocity represented by a first cyclic velocity curve such that said first can body transfer device periodically remains at least approximately stationary with a substantially zero velocity;

driving said second can body transfer device at a substantially sinusoidal velocity represented by a second, substantially sinusoidal velocity curve;

rolling blanks into can bodies at a roll former station;

moving the first can body transfer device possessing said first cyclic velocity curve, during rolling of the blanks into can bodies, past the roll former station in a manner such that the first can body transfer device remains at least approximately stationary in order to enable rolling of the can bodies and engagement of a rolled can body at the roll former station;

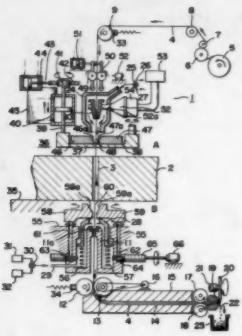
transferring the can bodies in a smooth fashion from the first can body transfer device to the second can body transfer device moving with said substantially sinusoidal velocity while the first can body transfer device is at least approximately at the region of its lowest velocity course of its first cyclic velocity curve; and

engaging the thus transferred can bodies by the second transport device and moving the engaged can bodies towards the welding electrodes.

4,417,118
AUTOMATIC WIRE-SETTING OR -RESETTING METHOD AND APPARATUS IN A TRAVELING-WIRE ELECTROEROSION MACHINE

Kastuyoshi Miyano, Kawasaki, Japan, assignor to Japax Inc., Kawasaki, Japan

Filed Jul. 27, 1981, Ser. No. 287,043
Claims priority, application Japan, Jul. 28, 1980, 55-102423
Int. Cl.³ B23P 1/12
U.S. Cl. 219—69 W **16 Claims**



1. A method of automatically setting or resetting a machining electrode wire in an operating set-up on a traveling-wire electroerosion machine having a pair of guide members defining therebetween a straight line path for the electrode wire and drive means for axially displacing the electrode wire along the straight line path between wire supply means and wire takeup means, the method comprising the steps of:

(a) positioning a workpiece with a preformed straight through-hole between said guide members to locate said through-hole in alignment with said straight line path;

(b) disposing ahead of one of said guide members and spacedly juxtaposed with said through-hole of the workpiece, a broken free end portion of the electrode wire extending in alignment with said straight line path and leading to one of said supply means and said takeup means;

(c) vibrating said free end portion of the electrode wire with a small amplitude by imparting mechanical vibrations to said one guide member;

(d) threading said vibrating free end portion of the electrode wire by automatically advancing it into, through and out of said through-hole towards the other of said guide members by said drive means; and

(e) thereafter establishing a continuous stretch constituted at least in part by said threaded electrode wire between said supply means and said takeup means whereby to enable it to be continuously renewed from said supply means and collected onto said takeup means for electroerosion-machining of said workpiece.

4,417,119
LIQUID JOINT PROCESS

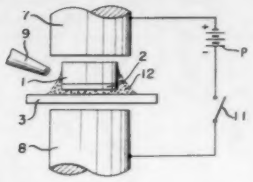
Takio Okuda, and Junichi Sakai, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1981, Ser. No. 275,939
Int. Cl.³ B23K 1/04, 35/38
U.S. Cl. 219—72 **4 Claims**

1. A liquid joint process for joining an electrical contact and a carrier having a clearance formed therebetween which comprises feeding a liquid in and around said clearance formed between said electrical contact and said carrier so as to form an arcuate shaped liquid surface which is in contact with both said electrical contact and said carrier;

holding said electrical contact and said carrier by an upper electrode and a lower electrode from both sides under a predetermined pressure; and

feeding current between said electrical contact and said

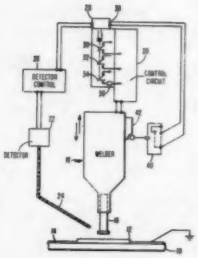


carrier through said upper and lower electrode wherein said feeding of liquid comprises feeding liquid in an amount of 0.1 to 2 cc on and near an electrical contact interface between said contact and said carrier.

4,417,120
PERCUSSIVE ARC WELDING

Douglas L. Lumbra, St. Albans; Douglas W. Phelps, Jr., Burlington; Sigvart J. Samuelsen, Burlington, and William C. Ward, Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,476
Int. Cl.³ B23K 9/10, 9/22
U.S. Cl. 219—96 **14 Claims**



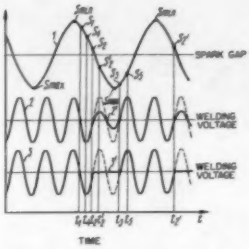
10. In the method of percussive arc welding a workpiece to a base piece wherein the welding cycle includes first applying an initiating voltage between the workpiece and the base piece to establish an arc therebetween, and thereafter a capacitive discharge is established between the workpiece and the base piece which will cause melting of the pieces, and the workpiece is plunged into the base piece to effect a weld between the two pieces, the improvement which comprises:

prior to the initiation of the welding cycle applying a test voltage between the workpiece and the base piece of no greater value than the initiating voltage of the welding cycle thereby generating an arc and, detecting whether an arc is established between the workpiece and the base piece by the test voltage, and thereafter inhibiting the performance of the weld cycle if the establishment of an arc by the test voltage is not detected.

4,417,121
METHOD OF FLASH BUTT WELDING

Sergei I. Kuchuk-Yatsenko; Mikhail V. Bogorsky, and Sergei M. Samotryasov, all of Kiev, U.S.S.R., assignors to Institut Elektrosvarki, Imeni E.O. Patona, Kiev, U.S.S.R.

Filed Dec. 15, 1981, Ser. No. 330,805
Int. Cl.³ B23K *11/04*
U.S. Cl. 219—104 **2 Claims**



1. A method of flash butt welding, which comprises fusing by an alternating current the ends of the parts being welded together, concurrently causing the parts to continuously approach each other, and imparting to at least one of the parts an oscillatory motion along the direction of approach, thereby causing additional relative movements of the parts being welded together towards each other and away from each other, reducing the welding voltage to within the range of 0.7 to 0 of its working value during the stage of a relative movement of the parts being welded together away from each other in a time interval of not less than ¼ of the period of the oscillatory motion from the beginning of the relative movement of the parts away from each other, and restoring the voltage to its initial value at the stage of a relative movement of the parts being welded together towards each other in a time interval of not more than ¼ of the period of the oscillatory motion from the beginning of the relative movement of the parts towards each other.

4,417,122
RESISTANCE WELDING SYSTEM FOR PROJECTION WELDING

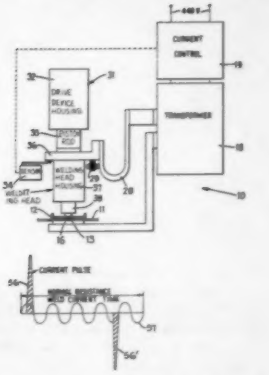
J. Paul Thorne, Bay City, Mich., assignor to Newcor, Inc., Bay City, Mich.

Filed Jul. 30, 1981, Ser. No. 288,424
Int. Cl.³ B23K *9/09, 11/14*
U.S. Cl. 219—108 **5 Claims**

1. In a resistance welding apparatus for welding together two platelike workpieces and comprising:

a transformer unit having cooperating primary and secondary windings, electrical conductor means for connecting said primary winding to a source of alternating current electrical energy, a welding head connected to the secondary winding of said transformer unit, and control means including switch means interposed in said conductor means for permitting only a single pulse of electrical energy of duration less than one cycle of said alternating current source to be supplied therethrough to the primary winding of said transformer unit,

the improvement comprising means for projection welding of first and second metal sheets each having a thickness in the range of about 0.020 to 0.050 inch with the welding being at a beadlike projection in the first sheet in contact with the second sheet, including a stationary conductive back-up die supporting said second sheet, a welding head assembly which incorporates and supports said welding head for axial reciprocation with respect to said transformer unit, said welding head comprising an axially reciprocable low-inertia electrode and holder positioned for pressing engagement of the electrode with the first sheet directly at the projection, means continuously biasing the low-inertia electrode holder toward the first sheet for rapid follow-up movement by the electrode holder of the collapsing projection to continue pressing of the first and second sheets together during a weld, said transformer unit being a single welding transformer of low mutual reactance and high secondary voltage relative to conventional multicycle resistance welding transformers, the primary of the welding transformer being connected to a conventional power line source of about 460 volt 60 hertz electrical energy through said switch means for energization by a single unipolarity pulse of the approximately 460 volt 60 hertz power line electrical energy, means triggering said switch means in each welding cycle for outputting at said secondary only a single unipolarity



pulse of approximately 3 to 4 millisecond duration and of high current magnitude and fast rise time relative to conventional multicycle resistance welding transformers, said welding transformer being stationary and disposed adjacent said welding head assembly, the secondary of said stationary transformer being electrically connected to said reciprocating holder by an intermediate flexible electrical conductor and being electrically connected to and fixed with respect to said conductive back-up die, said welding head assembly being a conventional one of the kind including a drive device reciprocally driving the welding head between retracted sheet releasing and extended sheet engaging positions and in which the movable welding head includes an electrically conductive housing connected to and driven by the drive device with said holder being movably supported on said housing and in electrically conductive contact therewith.

4,417,123
LASER FORMED VIDEO TUBE CALIBRATION MARKERS

Patrick N. Keller, Ridgecrest; Jerome B. Franck, China Lake, and George G. Silberberg, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

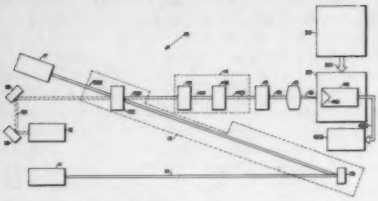
Filed Jul. 6, 1981, Ser. No. 280,767
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LH **15 Claims**

1. An apparatus for forming fiducial marks on an imaging surface of a video tube, comprising:

a laser system for producing and directing an alignment focused beam and a pulsed focused beam, upon command, along an optical path;

a driven jig positioned for holding said imaging surface of said video tube on said optical path;

a controller connected to said driven jig and programmed to move said driven jig in a predetermined manner; and



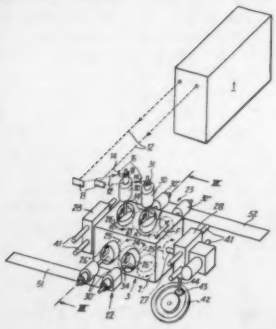
video monitoring means coupled to said video tube for observing said alignment focused beam and the effects of said pulsed focused beam on the imaging surface of said video tube.

4,417,124

PROCESS AND INSTALLATION FOR MACHINING BY RADIATION A COMPOSITE PART

Claude Benedite, Panazol; Marcel Lafaye, Nexon; Jean-Pierre Lenfant, Rochechouart, and Jacques Reynier, Bosmie L'Aiguille, all of France, assignors to Claude Benedite Laser Techniques Saint-Cyr, St-Laurent-sur-Gorre, France

Filed Nov. 2, 1981, Ser. No. 317,406
Claims priority, application France, Nov. 7, 1980, 80 23847
Int. Cl.³ B23K 27/00
U.S. Cl. 219—121 LH 5 Claims



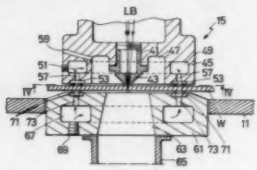
1. Process for treating, by electromagnetic radiation, a plane surface of a composite piece comprising a first material relatively more absorbent of this radiation and a second material relatively less absorbent of this radiation, these two materials appearing by zones at the surface, this composite piece being part of a mass located beyond an edge limiting the plane surface to be treated, according to which the radiation is given an inclination α in relation to a perpendicular to this surface, the values of this inclination α being determined so that the mass is protected by always remaining in the shadow limited by said edge of the treated surface and so that any beam reflected by the latter surface will be directed in a predetermined direction.

4,417,125

LASER PROCESSING MACHINE

Akira Tsutsumi, La Mirada, Calif., assignor to Amada Engineering & Service Co., Inc., La Mirada, Calif.

Filed Feb. 19, 1982, Ser. No. 350,416
Claims priority, application Japan, Feb. 24, 1981, 56/25023
Int. Cl.³ B23K 27/00
U.S. Cl. 219—121 LY 4 Claims



1. A laser processing machine, comprising:

a table means for supporting a workpiece to be processed at a work area;

a processing head assembly arranged above the table means;

a nozzle means, connected at a lower end of the processing head assembly, for applying a laser beam to the workpiece together with an assisting gas at the work area; and

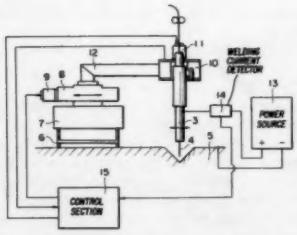
means, provided at the work area, for supplying air to both sides of the workpiece in order to keep the workpiece to be processed in a floated position out of contact with the table means and with the processing head assembly while the laser beam is being applied to the workpiece together with the assisting gas.

4,417,126

METHOD OF CONTROLLING A WEAVING PATH OF A WELDING TORCH IN ARC WELDING WITH A CONSUMABLE ELECTRODE

Kenji Kasahara, Fujisawa, and Yoshiaki Munezane, Kamakura, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 4, 1982, Ser. No. 374,735
Claims priority, application Japan, Sep. 24, 1981, 56-151553
Int. Cl.³ B23K 9/12
U.S. Cl. 219—124.22 3 Claims



1. A method for controlling a weaving path of a welding torch to trace a welding line in consumable electrode arc welding, the comprising:

detecting in a rightward weaving stroke of weaving motion a welding current level IL_1 at the left end position of the weaving and a minimum current level IL_2 during the period of the rightward weaving stroke and in a leftward weaving stroke of weaving a welding current level IR_1 at the right end position of the weaving motion and a minimum current level IR_2 during the period of the leftward weaving stroke;

calculating the values of differential current (IL_1-IL_2) and

(IR_1-IR_2) in the rightward and leftward weaving strokes, respectively;

comparing and computing a disparity, if any, between said differential current values; and

shifting the position of a median point of weaving motion according to the extent of said disparity in said differential current values.

4,417,127

METHOD AND APPARATUS FOR SEAM TRACKING IN ARC WELDING

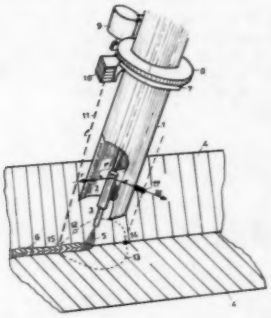
Georgi N. Nachev; Angel S. Angelov, and Boryan I. Petkov, all of Sofia, Bulgaria, assignors to Institute Po Technicheska Kibernetika I Robotika, Sofia, Bulgaria

Filed Apr. 14, 1981, Ser. No. 254,095

Claims priority, application Bulgaria, May 19, 1980, 47828; Jul. 11, 1980, 48465

Int. Cl.³ B23K 9/12

U.S. Cl. 219—124.34 12 Claims



1. A method of guiding an operating implement along a distinctive tracking line on a workpiece area, comprising the steps of:

(a) training a narrow beam of luminous radiation upon said workpiece area in the vicinity of said operating implement;

(b) shifting said beam around said operating implement to illuminate said workpiece area along a trace intersecting said tracking line at two crossover points forwardly and rearwardly of said operating implement;

(c) gathering rays from the illuminated trace by an objective with front and rear focal planes spaced from said workpiece area and with an optical axis including a small angle with said beam, said objective moving jointly with said beam for focusing images of illuminated scanning points of said trace upon a segment of a straight line slantingly intersecting said rear focal plane;

(d) detecting discontinuities in a curve interconnecting the images of said scanning points, said discontinuities representing said crossover points; and

(e) determining deviations of said operating implement from said tracking line on the basis of the locations of said discontinuities on said segment.

4,417,128

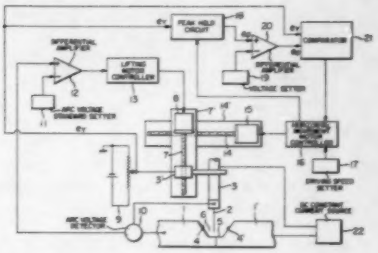
ARC WELDING METHOD UTILIZING RECIPROCAL MOVEMENT OF A TORCH IN WIDTH DIRECTION OF GROOVE TO BE WELDED, AND CONTINUOUS MOVEMENT OF TORCH IN LONGITUDINAL DIRECTION OF GROOVE TO BE WELDED

Hirokazu Nomura; Yuji Sugitani, both of Tsu, and Yasuo Suzuki, Hisai, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1982, Ser. No. 345,231

Int. Cl.³ B23K 9/12

U.S. Cl. 219—125.12 3 Claims



1. In an arc-welding method, which comprises:

directing a welding torch substantially vertically toward a groove formed between objects of welding; directing a welding electrode through said torch toward said groove; feeding a welding current to said electrode to produce an arc between the tip of said electrode and said groove to weld said objects of welding together by means of the arc heat; moving said torch in the width direction of said groove; continuously detecting one of arc voltage and arc current of said arc; calculating the deviation of the thus detected value from a value of one of previously set arc voltage and arc current; moving said torch vertically up and down so that said deviation becomes null, thereby maintaining the distance between the tip of said electrode and said groove at a prescribed distance during the movement of said torch in the width direction of said groove; continuously detecting the vertical position of said torch as a value of voltage indicated by a potentiometer for each movement of said torch in the width direction of said groove; reversing the direction of the movement of said torch in the width direction of said groove at the moment when said value of voltage thus detected agrees with a previously set value of voltage; repeating the movement of said torch in the width direction of said groove, the movement of said torch in the vertical direction, and the reversal of the direction of the movement of said torch in the width direction of said groove; continuously moving said torch in the longitudinal direction of said groove; thereby reciprocally moving said torch in the width direction of said groove following the face of said groove while maintaining the distance between the tip of said electrode and said groove at said prescribed distance, and, at the same time, moving said torch in the longitudinal direction of said groove so as to weld said objects of welding in the longitudinal direction of said groove;

the improvement characterized by:

calculating, for one movement of said torch in the width direction of said groove, the value of the difference between said previously set value of voltage for the purpose of reversing the direction of movement of said torch in the width direction of said groove and the value of voltage detected by said potentiometer when said torch is at the lowest position thereof; and,

reversing the direction of movement of said torch in the width direction of said groove at the moment when said

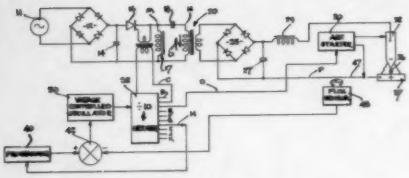
continuously detected value of voltage of said torch agrees with said calculated value of difference.

4,417,129

POWER SOURCE FOR ARC WELDER

Russell D. Young, Redondo Beach, Calif., assignor to Creative Pathways, Incorporated, Torrance, Calif.

Filed Dec. 20, 1982, Ser. No. 451,466
Int. Cl.³ B23K *9/10*
U.S. Cl. 219—130.32 **10 Claims**



1. A power source for providing pulses welding current to the electrodes of an arc welder comprising:

means for supplying DC power,

electronic switching means having current carrying electrodes between which the DC power is fed and a switching control electrode,

means for generating a series of sequential trigger pulses, each of said pulses appearing at a separate terminal, a first one of said trigger pulses being fed to the switching control electrode of the switching means to effect the firing thereof to cause current pulses to flow between the current carrying electrode,

programmer means for generating a signal in accordance with a predetermined program representing the desired welding current,

means for sensing the welding current and providing a feedback signal in accordance therewith,

means for comparing the feedback signal with the programmer means signal and generating a signal in accordance with any difference therebetween, the output of the comparing means being fed to said trigger pulse generating means to control the frequency of the trigger pulses,

arc starter means for starting the welding arc, said arc starter means being triggered in response to a second one of said trigger pulses,

commutating inductor means for unfiring said electronic switching means a predetermined time after the firing thereof, and

means for coupling the current pulses passing between the current carrying electrodes of the electronic switching means to the arc welder electrodes.

4,417,130

TRANSISTOR TYPE PULSE WELDING DEVICE

Toshio Banba; Masanori Mizuno, and Takaii Mizuno, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 326,993
Claims priority, application Japan, Dec. 11, 1980, 55-177974[U]
Int. Cl.³ B23K *9/09*
U.S. Cl. 219—130.51 **9 Claims**

1. A transistor type pulse welding circuit, comprising:

a DC source;

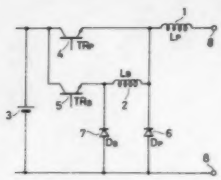
an output terminal;

a first metal core;

a second metal core separate from said first metal core;

a first series circuit connected between said source and output terminal, said first series circuit comprising a first switching element and first inductive coil connected in series, said first coil being wound on said first core;

a second series circuit connected in parallel with at least said first switching element, said second series circuit including a second switching element and a second inductive coil wound on said second core;



a first diode coupled between said source and a first connection point between said first switching element and first inductive element; and

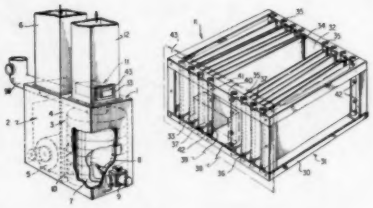
a second diode coupled between said source and a second connection point between said second switching element and second inductive element.

4,417,131

ALTERNATIVE HEATING APPARATUS FOR USE IN A HEATING SYSTEM HAVING A FUEL BURNER, PARTICULARLY A FORCED-AIR CENTRAL HEATING SYSTEM

Douglas E. Carl, Burlington, Canada, assignor to Canada Thermofilm Limited, Concord, Canada

Filed Oct. 3, 1980, Ser. No. 193,848
Claims priority, application Canada, Oct. 12, 1979, 337446
Int. Cl.³ F24D *5/00*; H05B *3/14*
U.S. Cl. 219—279 **13 Claims**



1. A forced-air heating system comprising a main furnace, an outlet duct for conveying air from the furnace to a space to be heated, a blower for forcing air through the furnace, an auxiliary electric heater disposed so that air flowing through the main furnace flows thereover, first temperature responsive means responsive to inside air temperature, second temperature responsive means responsive to outside air temperature, and control means operable, when the inside air temperature is below a first predetermined level, to activate only said auxiliary electric heater if the outside air temperature is above a second predetermined level and only said main furnace if the outside air temperature is below said second predetermined level, said second predetermined level being selected taking into account electricity demand-temperature dependency such that above said second predetermined temperature level electricity demand is generally at an off-peak level wherein:

said auxiliary heater comprises a housing having opposed apertures forming an inlet and an outlet and defining a flow path therebetween, and a plurality of panels arranged to extend across said housing between said apertures and parallel to said flow path to define uninterrupted channels

between said inlet and said outlet such that air flows between said panels directly from said inlet to said outlet without passing through said panels.

4,417,132

APPARATUS FOR HEATING ELECTRICALLY CONDUCTIVE FLOWABLE MEDIA

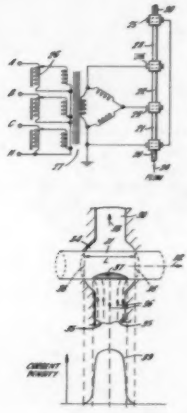
David P. Simpson, Westminster Park, England, assignor to The Electricity Council, England

Filed Jan. 14, 1981, Ser. No. 225,073

Claims priority, application United Kingdom, Jan. 21, 1980, 8001995

Int. Cl.³ H05B *3/60*; A23L *3/32*

U.S. Cl. 219—291 **13 Claims**



1. Apparatus for heating an electrically conductive flowable medium, comprising pipe means through which the medium can be arranged to flow, said pipe means having an internal surface of a material having an electrical conductivity no greater than that of the medium,

at least two electrodes at spaced locations along the pipe means and having respective electrode surfaces exposed to medium flowing in the pipe means,

and supply means for applying an alternating electrical supply across said electrodes so that alternating current can flow in the medium between the electrodes,

each lectrode being located and arranged in the pipe means such that, in use, substantially all the current flows between the medium and a predetermined surface portion only of the exposed electrode surface, said predetermined surface portion being smoothly curved without sharp edges to avoid current density distortions over the surface portion, said predetermined surface portion being entirely within the edges of the exposed surface.

4,417,133

FUEL TANK HAVING AN IMMERSION HEATING ELEMENT ASSEMBLY

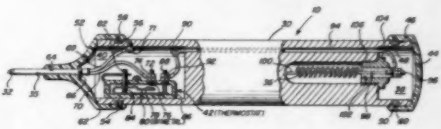
Johnny W. Sanner, P.O. Box 216, Billings, Mont. 59103

Filed Feb. 24, 1981, Ser. No. 237,584

Int. Cl.³ H05B *1/02, 3/82*; F24H *1/20*

U.S. Cl. 219—316 **2 Claims**

1. In combination, a fuel oil tank and an immersion heating element assembly, said tank including a peripheral wall including a curved bottom having a fuel oil outlet communicated with the bottommost area thereof, said peripheral wall of the tank including a filler pipe and closure in an upper area thereof, said heating element assembly including an elongated body having end caps removably secured thereto, said end caps being of non-metallic material and having a cylindrical peripheral surface supporting the elongated body in horizontal position on the curved bottom of the tank with the body being immersed in the fuel oil in the tank, said body including a longitudinally extending cavity in each end thereof with the end caps forming sealed closures for the cavities, an electric heating element in one of said cavities, an electrical circuit connected with said heating element, said electrical circuit including a thermostatic switch mounted in the other of said cavities for opening and closing the electrical circuit in response to the temperature of the fuel oil in which the body is immersed, said electrical circuit including electrical conductors extending from the cavity having the thermostatic switch therein out through the end cap on that cavity in sealed relation thereto to preclude entry of fuel oil into the cavity, said electrical conductors extending through the wall of the tank in sealed relation thereto for connection with a source of electrical energy, one of said conductors having the thermostatic switch incorporated therein and connected to the heating element, the other of said conductors being electrically connected to the heating element so that the heating element is electrically energized when the thermostatic switch is closed



and the conductors are connected to a source of electrical energy in order to heat the fuel oil in the tank in the area having the outlet associated therewith prior to the fuel oil leaving the tank, wherein said body is cylindrical and the cylindrical peripheral surface of each end cap includes a cylindrical flange telescoped over the cylindrical body at the end thereof and having a diameter greater than the body and being constructed of resilient plastic material and coacting rib and groove means extending peripherally of each end portion of the body and each end cap flange to provide a snap fit between the end cap and body, said thermostatic switch including adjustable contact means to vary the temperature at which the circuit is opened and closed, and wherein said body is constructed of conductive metal, said cavity receiving the heating element having an axial extension extending inwardly and receiving the heating element with one end of the heating element electrically connected to the body at the inner end of the extension with the conductor having the thermostatic switch therein being connected to the other end of the heatingelement, the other conductor being connected to said body within the cavity having the thermostatic switch therein.

4,417,134

MECHANICAL FUEL PUMP COMPUTER CONVERSION MECHANISM

Ronald M. Garland, Reigate, England, assignor to Veeder Industries Inc., Hartford, Conn.

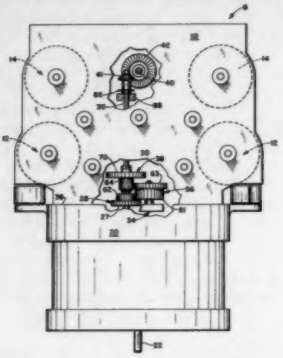
Filed Mar. 22, 1982, Ser. No. 360,395

Int. Cl.³ B67D *5/22*; F16H *3/22*; G06C *15/04*

U.S. Cl. 235—61 L **21 Claims**

1. In a mechanical computer for a fuel dispenser having a price variator with an input volume shaft to be rotated in accordance with the volume amount of fuel dispensed and settable for establishing the unit volume price of fuel, a volume counter rotary drive train rotated by the input volume shaft, at least one rotary volume counter, with a plurality of coaxial number wheels of increasing order of significance, rotated by the volume counter drive train for registering the volume amount of fuel dispensed, a cost counter rotary drive train rotated in accordance with the rotation of the input volume shaft and the unit volume price setting of the price variator, and at least one rotary cost counter, with a plurality of coaxial

number wheels of increasing order of significance, rotated by the cost counter drive train for registering the cost amount of fuel dispensed, the improvement wherein the cost counter drive train comprises a cost drive ratio selector mechanism for



selectively providing a plurality of different alternative cost counter drive ratios which include two drive ratios which differ by a factor of ten to provide for selectively shifting the decimal point in the unit volume price setting of the price variator and in the cost registration of the cost counter.

4,417,135

POWER SAVING ELECTRONIC COUNTER CIRCUIT FOR TAPE RECORDER

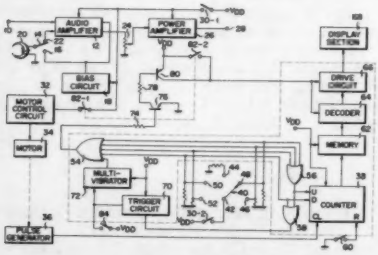
Kazuyasu Motoyama; Kenzi Furuta, and Katsumi Kanayama, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 9, 1980, Ser. No. 148,526

Claims priority, application Japan, May 28, 1979, 54-6583879; May 28, 1979, 54-7149479[U]

Int. Cl.³ G11B *27/34;* H03K *21/30*

U.S. Cl. 377—18 **9 Claims**



1. In a tape recorder having a rotatable tape running means, mode setting means coupled to said tape running means for setting an operation mode of the tape recorder, and a source of electrical power, a device for displaying a tape running position of the tape in the tape recorder, comprising:

means coupled to said tape running means and to said power source for generating pulses as a function of the rotation of said tape running means;

electronic counter means coupled to said pulse generating means and to said power source for counting pulses of the output signal of said pulse generating means;

display means coupled to said counter means and to said power source for displaying the count value of said counter means;

signal producing means coupled to said mode setting means and to said power source for producing a signal for a predetermined period of time upon detecting that the tape recorder is set in a non-operating mode; and

power switching means coupled to said signal producing means for stopping power supply from said power source at least to said display means in response to the termination of the output signal from said signal producing means at the end of said predetermined period of time.

4,417,136

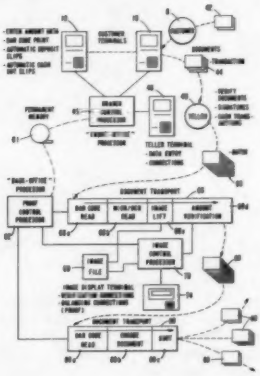
METHOD AND APPARATUS FOR IMPROVING BANK OPERATION PRODUCTIVITY

Robert J. Rushby, Waterloo, and Anthony B. Damms, Kitchener, both of Canada, assignors to NCR Canada Ltd - NCR Canada Ltee, Mississauga, Canada

Filed Aug. 5, 1981, Ser. No. 290,029

Int. Cl.³ G06F *15/30*

U.S. Cl. 235—379 **19 Claims**



1. A system for processing financial transactions, said system comprising:

first processing means;

first terminal means, coupled to said first processing means, for permitting a customer to enter into said first processing means information obtained from a document of the customer, said document being contained in a financial transaction;

second terminal means, coupled to said first processing means and said first terminal means, for enabling a teller to verify said customer-entered information;

first storage means, coupled to said first processing means, for storing said customer-entered information subsequent to said teller verification;

second processing means for receiving said teller-verified customer-entered information stored within said first storage means;

document processing means for generating information from said document of the customer; and

third processing means for automatically comparing information generated by said document processing means with said customer-entered information within said second processing means for correspondence therebetween.

4,417,137

APPARATUS FOR DISPENSING SHEET-LIKE ELEMENTS FROM A STORE OF SUCH ELEMENTS, FOR EXAMPLE BANKNOTES, TO ONE OF A PLURALITY OF RECEIPT OPENINGS ACCESSIBLE TO, FOR EXAMPLE, CASHIER OR CUSTOMER

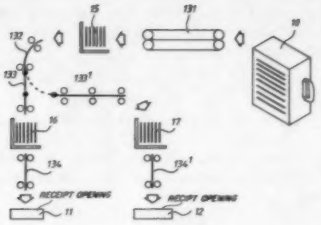
Leif Lundblad, Häradsvägen 102, S-141 41 Huddinge, Sweden

Filed Jun. 9, 1982, Ser. No. 386,813

Claims priority, application Sweden, Jul. 30, 1981, 8104600

Int. Cl.³ G06F *15/30*

U.S. Cl. 235—379 **7 Claims**



1. An apparatus for dispensing sheet-like elements from a store (**10**) of such elements to a plurality of receipt openings (**11,12**) arranged in said apparatus and accessible to a plurality of individuals, comprising:

conveying means (**131–134'**) for conveying said dispensed sheet-like elements from said store (**10**) to a predetermined one of said receipt openings;

means for electronically controlling said conveying means (**131–134'**) in response to an order made by any one of said individuals for said sheet-like elements so that said conveying means conveys ordered sheet-like elements from said store (**10**) to said predetermined receipt opening (**11**) in a form of a bundle;

said conveying means comprising for each receipt opening retaining and holding means (**16,17**) which is individually alotted to said receipt openings (**11,12**) and which retains said ordered sheet-like elements for a time period determined by said electronic control means.

4,417,138

CREDIT CARD, PROCESS AND MARKING APPLIANCE FOR MANUFACTURING SAID CREDIT CARD, AND MARKING APPLIANCE FOR MARKING SAID CREDIT CARD IN ORDER TO EFFECT DEDUCTIONS FROM A CREDIT REPRESENTED BY THE CARD

Horst Pfeiffer, Aldingen, Fed. Rep. of Germany, assignor to J. Hengstler K.G., Aldingen, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,062

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112664

Int. Cl.³ G06K *19/06*

U.S. Cl. 235—492 **36 Claims**

1. In a credit card having at least one surface provided with an electrically conducting coating which is adapted to be marked by the action of an electric current flowing through said coating in a selected areas thereof, which surface comprises at least one credit-representing area adapted to be visibly marked in order to effect deductions from the credit represented by said card,

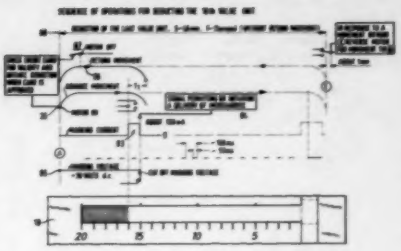
the improvement residing in that

said coating includes a terminal area, said at least one credit-representing area, and at least one code-representing area,

said credit-representing area is electrically conductively connected on one side to said terminal area,

said code-representing area has a portion which is electrically conductively connected to said terminal area and at least one isolated portion which is electrically disconnected from said terminal area, and

said surface of said credit card has electrically non-conducting portions which are free from said coating and define



said at least one credit-representing area except on said one side and define said at least one isolated portion of said at least one code-representing area and which separate said at least one credit-separating area and said isolated portions from said terminal area.

4,417,139

FOCUS DETECTING APPARATUS

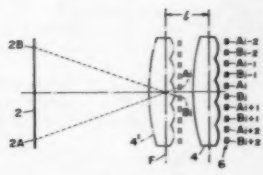
Yosuke Kusaka, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 16, 1981, Ser. No. 331,317

Claims priority, application Japan, Dec. 26, 1980, 55-183695

Int. Cl.³ G01J *1/36*

U.S. Cl. 250—204 **5 Claims**



1. An apparatus disposed in the light beam from an object passed through an imaging lens for producing an output varialbe with movement of the imagge of the object by said imaging lens in the direction of the optical axis, said apparatus producing, when the image of said object is formed on a predetermined imaging plane, an output corresponding to a critical value representative of the in-focus of said imaging lens to said object and producing, when the image of said object is formed at a position deviated from said predetermined imaging plane, an output corresponding to the amount of said deviation, said apparatus comprising:

(a) detector means disposed at a position biased in the direction of the optical axis from said predetermined imaging plane so as to procude an output corresponding to said critical value when the image of said object is formed on a plane biased by a predetermined amount in the direction of the optical axis from said predetermined imaging plane and to produce an output corresponding to said predetermined amount of bias when the image of said object is formed on said predetermined imaging plane;

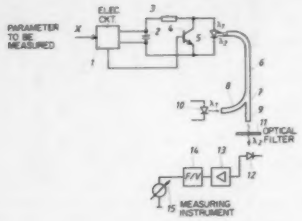
(b) memory means in which a data representative of said predetermined amount of bias is prerecorded; and

(c) means for correcting the output of said detector means on the basis of said prerecorded data.

4,417,140
FIBRE OPTIC MEASURING DEVICE WITH ELECTRICALLY CONTROLLED PHOTOLUMINESCENCE

Morgan Adolfsson; Torgny Brogardh, and Christer Ovren, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Jun. 22, 1981, Ser. No. 275,789
Claims priority, application Sweden, Jun. 23, 1980, 8004602
Int. Cl.³ G01D 5/26
U.S. Cl. 250—227 **22 Claims**

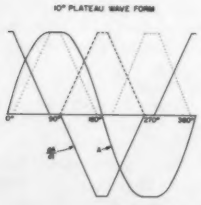


1. A fiber optically coupled measuring device comprising,
an optically energised transducer section for generating signal information in optical form from a body of photoluminescent material,
a receiving section remote from the transducer section for producing a measuring signal from said signal information,
means for producing excitation light for the said body in the transducer section, and
fiber optic means for feeding excitation light to the transducer section and for passing signal information from the transducer section to the receiving section, wherein,
the said body has electrically-dependent photo-luminescent properties such that the optical signal information it generates is modifed by an electrical signal applied thereto, and
said transducer section includes transducer means to produce an electrical signal which varies in dependence on a parameter to be measured and to feed said electrical signal to the body.

4,417,141
OPTICAL SHAFT ANGLE ENCODER

David T. Phillips, Santa Barbara, Calif., assignor to Electro-Craft Corporation, Hopkins, Minn.

Filed Jun. 10, 1981, Ser. No. 272,397
Int. Cl.³ G01P 3/44
U.S. Cl. 250—231 SE **3 Claims**

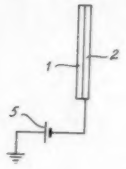


1. An optical encoder for providing an output signal indicative of relative motion between a scale and a frame, including illumination means and detector means mounted on a frame, said detector means constructed and arranged to receive illumination from said illumination means and producing an output signal proportional to the amount of illumination received thereon and scale means having a pattern of transparent and opaque segments thereon, said pattern interposed between said illumination means and said detector means, the improvement comprising:
mask means mounted fixedly on said frame interposed between said illumination means and said detector means, said mask means characterized by at least one transparent segment aligned with the transparent and opaque segments of said scale means, the shape of said mask means selected to transmit illumination to said detector means as relative motion is introduced between said scale means and said frame, such that the waveform of the derivative of the output signal produced by said detector means is trapezoidal.

4,417,142
METHOD AND APPARATUS FOR DETECTING ALPHA-EMITTING SUBSTANCES

Erik L. Malmqvist, Skelleftea, and Krister Kristiansson, Lund, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed May 27, 1981, Ser. No. 267,693
Claims priority, application Sweden, Jun. 9, 1980, 8004273
Int. Cl.³ G01V 5/00
U.S. Cl. 250—253 **8 Claims**

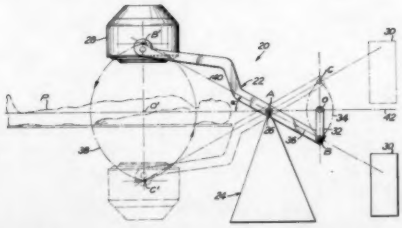


1. A method for detecting and measuring alpha-emitting substances, such as radon and/or daughter products of radon, by registering nuclear tracks on a detector, characterized by conducting away during the measuring any electrostatic fields which may have built up at the detector.

4,417,143
APPARATUS FOR DRIVING A RADIATION DETECTOR

Werner J. Haas, Inverness, and Frank C. Scribano, Western Springs, both of Ill., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Jun. 15, 1981, Ser. No. 273,446
Int. Cl.³ G01T 1/20
U.S. Cl. 250—363 S **10 Claims**



1. Supporting structure for driving a detector head of a radiation detector for emission computerized tomography, comprising an arm supporting the head adjacent an end thereof;

a base providing a fulcrum, the arm being moveably mounted on the base at the fulcrum;

means for counterbalancing the moment of the arm about the fulcrum due to the weight of the head; and means for driving the arm about the fulcrum so that the head traverses an arc with the head facing inward and so that a reference line drawn from the fulcrum to the head describes a conical surface having the fulcrum at its apex and the arc at its base.

4,417,144

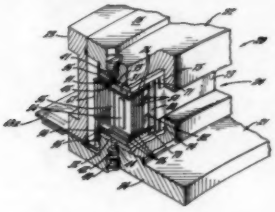
MODULAR SOLID-STATE DETECTOR CELL

David M. Hoffman, New Berlin; Neil W. Loomis, Muskego; Ralph C. Ehlert, Milwaukee, and Peter S. Shelley, Brookfield, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Feb. 23, 1981, Ser. No. 236,738

Int. Cl.³ G01T *1/22*

U.S. Cl. 250—367 **8 Claims**



1. In a scintillation detector for a CT scanner, the improvement comprising, a pair of opposed detector end members carrying a plurality of slots aligned to intercept a swath of radiation from an X-ray source in the scanner, a plurality of flat collimator plates dimensioned to closely fit in opposed slots in the end members to define a plurality of detector cells, a scintillator body and at least one photoresponsive semiconductor secured to each plate whereby each cell is independently provided on a single substrate with means to transform incident X-radiation into a measurable electrical signal.

4,417,145

APPARATUS FOR CONTROLLING MAGNETIC FIELD INTENSITY

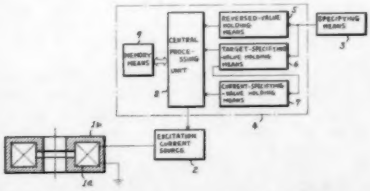
Setsuo Norioka, Akishimashi, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Sep. 25, 1981, Ser. No. 305,404

Claims priority, application Japan, Sep. 26, 1980, 55-133888

Int. Cl.³ G21K *1/08*; H01J *37/00*

U.S. Cl. 250—396 ML **4 Claims**



1. In a device for producing a magnetic field comprising an electromagnetic coil and hysteretic yoke associated therewith, a control apparatus for receiving target signals indicative of a desired flux density and producing an output signal for controlling the current source to produce the desired flux density

said control apparatus comprising a memory in which data defining the hysteretic characteristics of the yoke are stored;

means for holding a new target signal;

means for holding present and past target signals; and

means for collating the new target signal, the present and past target signals and comparing to the data in the memory to generate an output signal for controlling the current source.

4,417,146

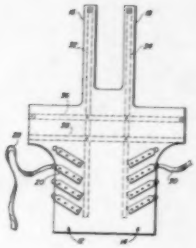
X-RAY ATTENUATING APRON

Linton M. Herbert, 14255 Rosemary La. #8104, Largo, Fla. 33540

Filed Jul. 10, 1981, Ser. No. 282,135

Int. Cl.³ G21F *3/02*

U.S. Cl. 250—516.1 **14 Claims**



1. An X-ray attenuating apron comprising:

a. an apron fabricated from a radiation attenuating material including a body section having first and second sides, a top, outer and inner surfaces and a vertically distributed weight transfer region, the apron further including first and second shoulder straps coupled to the top of the apron body section;

b. means for transferring substantially the entire weight of the shoulder straps to the weight transfer region, said means for transferring comprising first and second spaced apart vertical stiffeners coupled to and extending upward from the weight transfer region along the apron body section and through the first and second shoulder straps;

c. first and second tie straps; and

d. means for coupling one end of the first and second tie straps to the first and second sides of the apron body section at an adjustable vertical position within the weight transfer region to permit the tie straps to encircle the apron body section and secure the apron to the body of a wearer at a level within the weight transfer region and adjacent to the upper hip area of the wearer to thereby transfer the weight of the apron body section and shoulder straps to the wearer's hips.

4,417,147

METHOD AND APPARATUS FOR MEASURING RUNOUT IN A CYLINDRICAL OBJECT

Paul E. Faville, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 27, 1981, Ser. No. 238,854

Int. Cl.³ G01N *21/86*

U.S. Cl. 250—560 **10 Claims**

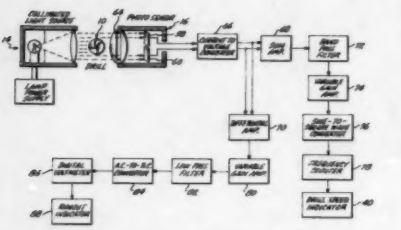
1. An apparatus for determining runout in an elongated, cylindrical object having 2n radially extending profile variations in the cross-sectional geometry thereof, wherein n is a predetermined integer, said apparatus comprising:

drive means for holding an elongated, cylindrical object along a first portion of its length and rotating the object about the longitudinal axis of such first portion with a second portion of the length of said object extending

therefrom, said drive means including means for rotating said object at a rate of R revolutions per second;

radiation source means for directing at least one beam of radiant energy transversely toward said second portion of said object from a location spaced apart from one side thereof, said radiation source means being positioned to direct said radiant energy on said second portion of said object with a portion of said beam passing tangentially across each of the two longitudinally extending, oppositely disposed surface regions of said object;

first and second detectors positioned on the opposite side of said object from said radiation source means, said first detector being positioned for partial illumination by the portion of said beam passing across the first one of said two oppositely disposed surface regions of said object and being positioned for partial shadowing by said second portion of said cylindrical object throughout a complete revolution of said object, said second detector being positioned for partial illumination by the portion of said beam



passing across the second one of said two oppositely disposed surfaces of said object and being positioned for partial shadowing by said second portion of said cylindrical object throughout a complete revolution of said object, said first and second detectors respectively supplying first and second electrical signals representative of the area of said first and second detector that is partially illuminated by said beam; and

circuit means connected for receiving said first and second electrical signals produced by said first and second detectors, said circuit means including signal processing means for supplying a difference signal representative of the difference between said first and second signals supplied by said first and second detectors, said circuit means further including filter means connected for receiving said difference signal, said filter means for supplying a signal representative of the runout of said object, said filter means configured and arranged for passing an electrical signal having a frequency substantially equal to R and for substantially attenuating signals at a frequency of 2nR.

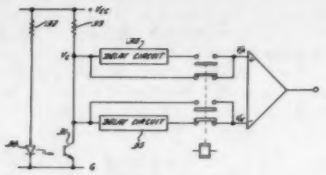
4,417,148

PHOTODETECTOR DEVICE FOR DETECTING THE FRONT AND REAR ENDS OF A MOVING SHEET

Eiji Otake, Kawaguchi, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 122,714, Feb. 19, 1980, abandoned. This application Jul. 23, 1982, Ser. No. 401,409
Claims priority, application Japan, Feb. 22, 1979, 54-19008
Int. Cl.³ G01N *21/86*
U.S. Cl. 250—561 **6 Claims**

1. A photodetector device for photoelectrically detecting the presence of a moving body, comprising an operational amplifier receiving as a first input an electric signal which is in proportion to variations in the quantity of light; a delay circuit for delaying the electric signal by a predetermined period of time and changeover means for applying the delayed electric signal to the operational amplifier as a reference input with respect to the first input, said changeover means for detection of the front and rear ends of the moving body in sequence,



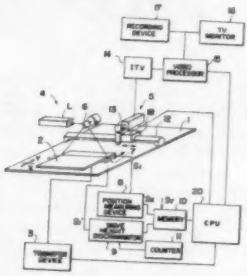
whereby the information of the presence of the moving body is obtained as an output from the operational amplifier.

4,417,149

APPARATUS FOR DETECTING AND MEASURING DEFECTS

Hideaki Takeuchi; Tsunehiko Takahashi, and Masaru Noguchi, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Sep. 18, 1981, Ser. No. 303,684
Claims priority, application Japan, Sep. 25, 1980, 55-133321
Int. Cl.³ G01N *21/72*
U.S. Cl. 250—563 **8 Claims**



1. An apparatus for detecting and measuring defects comprising a defect detection means for detecting the position of minute defects in the material under inspection, means for scanning the material with a light beam, means for generating position information regarding the minute defects detected by the detection means, a defect size measuring means for measuring the area of the minute defects detected by the defect detection means, memory means for storing the position information regarding the minute defects detected by the defect detection means, and operating means, for using the position information stored by the memory means, to move the defect size measuring means to the position for measuring the defects.

4,417,150

OPTICAL SYSTEM FOR DETERMINING PERIPHERAL CHARACTERIZATION AND DIMENSIONS OF A SHEET

Raymond D. Moran, Springdale, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 13, 1981, Ser. No. 292,566
Int. Cl.³ G01N *21/88*
U.S. Cl. 250—572 **17 Claims**

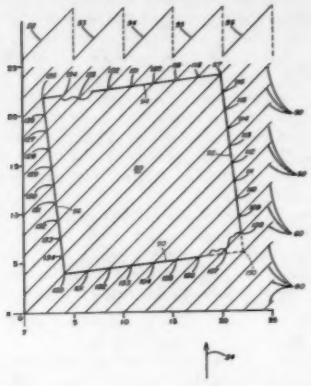
1. A method of determining peripheral edge characteristics of a discrete sheet comprising steps of:

directing energy beams toward a surface of the sheet to provide a scan path, the scan path extending beyond edge portions of the sheet;

moving the scan path and sheet relative to one another to

direct energy beams indicating edge portions of the sheet toward sensing means;

generating by way of the sensing means, a plurality of discrete signals as a function of intersection between edge



portions of the sheet and the scan path defined as intersection points; and

acting on the generated signals to determine peripheral edge characteristics of the sheet.

4,417,151

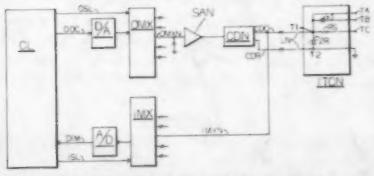
UNIVERSAL INPUT-OUTPUT DEVICE

George Klein, Manhasset Hills; Solomon Manber, Sands Point, both of N.Y.; Marvin Sudhalter, North Bergen, N.J., and Alvin Taylor, Bayside, N.Y., assignors to Distributed Control Systems, Inc., Great Neck, N.Y.

Filed Mar. 11, 1982, Ser. No. 357,058

Int. Cl.³ H02J *1/10*

U.S. Cl. 307—24 **8 Claims**



1. A universal input-output apparatus comprising: a plurality of controllable sources of electrical energy including at least one drive source having an output terminal and a return terminal; an electrical energy measuring means including at least one energy sensing means having an input terminal connected to the output terminal of one of said controllable sources of electrical energy; at least one line having a first lead and a second lead and having the first ends of said first and second leads connected to the output and return terminals of said drive source, respectively; and at least one integrity test means comprising a zener diode means connected across the second ends of said first and second leads respectively; a first terminal connected to one of said second ends, a second terminal, unidirectional conducting means interconnecting said one second end and said second terminal, a third terminal, and resistive means interconnecting said one second end and said third terminal.

4,417,152

ELECTRIC SWITCHING DEVICE

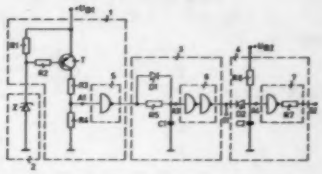
Heinz Fleischmann, Nuremberg, and Helmut Steckmann, Schwanstetten, both of Fed. Rep. of Germany, assignors to Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH, Nuremberg, Fed. Rep. of Germany

Filed Oct. 19, 1981, Ser. No. 312,853

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1980, 3039408

Int. Cl.³ H02J *9/00*

U.S. Cl. 307—64 **8 Claims**



1. An electronic switching device for generating control signals for an electrical device which contains a current supply device and devices fed therefrom, comprising:

an electronic switch controlled by;

a threshold value circuit which switches;

a supply voltage controlled by said threshold value circuit to;

a switch on delay circuit having;

a first control signal as an output, said first control signal being fed to;

a switch off delay circuit having as an additional input at least one auxiliary voltage source and as an output a second control signal so that during the switching on, or switching off, or during voltage fluctuations of said supply voltage at least one of said devices is connectable with at least said second control signal, to the auxiliary voltage source.

4,417,153

HIGH FREQUENCY SWITCHING CIRCUIT

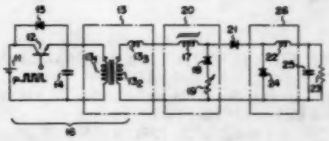
Toshihiro Onodera, Kunitachi; Youichi Masuda, Yokohama; Akira Nakajima, Yokosuka; Yoshio Takamura; Seiji Kajiwara, both of Yokohama, and Shoichi Higo, Zama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 16, 1982, Ser. No. 349,094

Claims priority, application Japan, Feb. 17, 1981, 56-21938

Int. Cl.³ H01H *47/00*

U.S. Cl. 307—140 **20 Claims**



16. A switching circuit power supply comprising:

a first switching element having a first terminal adapted to be coupled to a first terminal of a DC power source and a second terminal;

means for ON/OFF operating said first switching element with predetermined frequency and conductive periods;

a resonance capacitor coupling said second terminal of said first switching element to a second terminal of said DC power source;

a first inductor in parallel with said resonance capacitor;

a second switching element having a first terminal coupled to said second terminal of said first switching element and having a second terminal;

a transformer having primary and secondary windings, said primary winding coupling said second terminal of said second switching element to said second terminal of said DC power source;

rectifying means coupled to said secondary winding; and

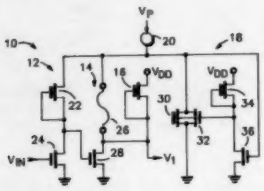
means for filtering an output from said rectifier and supplying a filtered power signal to a load.

4,417,154

CIRCUIT FOR APPLYING A HIGH VOLTAGE SIGNAL TO A FUSIBLE LINK

Clinton C. K. Kuo, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 8, 1982, Ser. No. 346,974
Int. Cl.³ G11C *17/00*
U.S. Cl. 307—202.1 **7 Claims**



1. A circuit for applying a high voltage signal to a fusible link, comprising:

a transistor having a first current electrode coupled to a first power supply terminal, a second current electrode for providing an output signal, and a control electrode;

a fusible link having a first terminal coupled to a high voltage terminal for receiving the high voltage signal and a second terminal coupled to the second current electrode of the first transistor;

selection means for selectively coupling the high voltage terminal to the control electrode of the first transistor;

a load device having a first terminal coupled to a second power supply terminal, and a second terminal coupled to the second current electrode of the first transistor; and

coupling means directly connected to the high voltage terminal for coupling the high voltage terminal to the first power supply terminal in response to the high voltage signal being absent from the high voltage terminal;

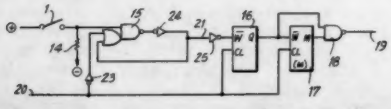
whereby in the absence of the high voltage signal, the output signal is provided via the fusible link at a voltage present at the first power supply terminal when the fusible link has not been opened; and the output signal is provided via the load device at a voltage present at the second power supply terminal when the fusible link has been opened.

4,417,155

ANTI-CHATTER CIRCUIT FOR SMALL PORTABLE APPARATUS

Hitomi Aizawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Chuo, Japan

Filed Jun. 25, 1981, Ser. No. 277,293
Claims priority, application Japan, Jun. 26, 1980, 55-87058
Int. Cl.³ H03K *17/56*
U.S. Cl. 307—247 A **11 Claims**



1. An anti-chatter circuit for a small portable apparatus comprising:

switch means for providing a signal output indicative of the instantaneous open or closed condition of said switch means;

first memory means for storing the signal output of said switch, said first memory means being adapted to store and output an instantaneous closed switch signal when the occurrence of a first read signal is concurrent with said closed switch signal, said first read signal being input to said first memory means, said stored closed switch signal being maintained and output by said first memory means only so long as said switch is closed;

second memory means for storing the output of said first memory means, said second memory means being adapted to store an output upon the occurrence of a second read signal, said second read signal being inputted to said second memory means, said first read signal leading said second read signal;

differentiation circuit means for outputting a signal in response to the output of said second memory means,

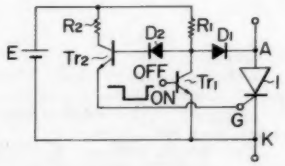
said signal from said differentiation circuit means occurs only when said switch closing signal persists for not less than the time between said first and second read signals.

4,417,156

GATE CIRCUIT FOR THYRISTORS

Hiroshi Fukui; Shin Kimura; Kenichi Onda, and Hisao Amano, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1981, Ser. No. 238,605
Claims priority, application Japan, Feb. 28, 1980, 55-24849
Int. Cl.³ H03K *17/72*
U.S. Cl. 307—252 C **6 Claims**



1. A gate circuit for a thyristor comprising a power supply for feeding gate-on current through a gate and cathode of said thyristor, a switching circuit connected in series with the power supply to turn the gate-on current on or off, a diode connected between a gate ignition signal input terminal of said switching circuit and the anode of said thyristor with the cathode of said diode coupled to said anode of said thyristor and the anode of said diode coupled to said switching circuit.

4,417,157

RADIO FREQUENCY SWITCH FOR COUPLING AN RF SOURCE TO A LOAD

David N. Gershberg, Rockville, Md.; Alexander Y. Lee, Jr., Arlington, and William B. Moore, Falls Church, both of Va., assignors to E-Systems, Inc., Dallas, Tex.

Division of Ser. No. 74,502, Sep. 11, 1979, Pat. No. 4,286,260.
This application Feb. 27, 1981, Ser. No. 238,849
Int. Cl.³ H03K *17/74*
U.S. Cl. 307—256 **20 Claims**

1. A radio frequency switch for coupling an RF source to a load, the radio frequency switch comprising:

an input diode and an output diode,

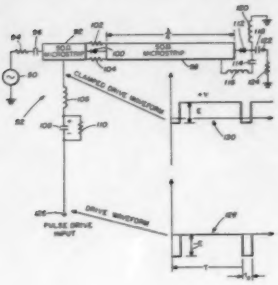
means for connecting said input diode to the RF source and to a switch drive signal, said switch drive signal including drive pulses for actuating said switch,

means for connecting output diode to the load,

a quarter wavelength RF impedance inverter interconnecting said input diode to said output diode, and

means connected to said means for connecting said input diode to the RF source for clamping said switch drive

signal to a predetermined voltage between said drive pulses, whereby the impedance of said switch with respect



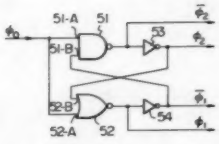
to said source remains substantially constant during the entire operation of said switch.

4,417,158

CLOCK GENERATOR CIRCUIT

Akihiko Ito, Kawasaki; Hisami Tanaka, Yokohama; Yoshihisa Takayama, Kawasaki, and Seiji Kato, Yamato, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 18, 1981, Ser. No. 322,720
Claims priority, application Japan, Nov. 20, 1980, 55-163607
Int. Cl.³ H03K *3/037*
U.S. Cl. 307—269 **3 Claims**



1. A clock generator circuit for generating two pairs of clock signals by using a reference clock signal, comprising:

first and second logic circuits, each having first and second input terminals and an output terminal, for generating first and second clock signals, respectively, the first input terminal of each of said first and second logic circuits receiving said reference clock signal;

a first delay circuit, connected between the output terminal of said first logic circuit and the second input terminal of said second logic circuit, for delaying and inverting said first clock signal so as to generate a third clock signal which forms a pair with said first clock signal;

a second delay circuit, connected between the output terminal of said second logic circuit and the second input terminal of said first logic circuit, for delaying and inverting said second clock signal so as to generate a fourth clock signal which forms a pair with said second clock signal;

said first logic circuit detecting a change of the potential of said fourth clock signal so as to change the potential of said first clock signal, when the potential of said reference clock signal is high; and

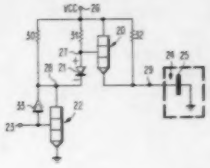
said second logic circuit detecting a change of the potential of said third clock signal so as to change the potential of said second clock signal, when the potential of said reference clock is low.

4,417,159

DIODE-TRANSISTOR ACTIVE PULL UP DRIVER

Jack A. Dorler, Wappinger Falls; Joseph M. Mosley, Hopewell Junction; Richard O. Seeger, Wappinger Falls, and Stephen D. Weitzel, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1981, Ser. No. 293,830
Int. Cl.³ H03K *5/00*
U.S. Cl. 307—270 **17 Claims**



1. A driver for rapidly pulling up a capacitive load, comprising:

a driver transistor having a base, an emitter and a collector, the collector of which is connected to a predetermined voltage and the emitter of which is connected to said capacitive load,

a diode having an anode and a cathode, the anode of which is connected to the base of said driver transistor,

forward bias current providing means connected to said anode, for providing forward bias current through said diode when a forward bias voltage is applied thereto, and

means for developing a forward diode voltage between said anode and said cathode to thereby cause forward bias current to flow through said diode from said forward bias current providing means and build up a diode diffusion capacitance between said anode and said cathode, and for connecting said predetermined voltage to said cathode, to thereby raise the base of said driver transistor above said predetermined voltage by an amount equal to said forward diode voltage,

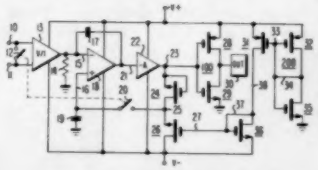
whereby the emitter of said driver transistor, and said capacitive load connected thereto, are pulled up to a voltage, which differs from said predetermined voltage by less than the base-emitter voltage drop of said driver transistor.

4,417,160

OFFSET COMPENSATION APPARATUS FOR BIASING AN ANALOG COMPARATOR

Otto H. Schade, Jr., N. Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,626
Int. Cl.³ H03K *5/08*; G06G *7/186*; H03F *1/02*
U.S. Cl. 307—353 **10 Claims**



1. In a potential measuring circuit including input and output circuits and means for selectively closing a negative feedback loop between said input and output circuits for periodically effecting drift voltage compensation of the circuitry connected between and including said input and output circuits, and means in said feedback loop for storing compensating voltages

as a reference potential during periods when said feedback loop is open, and including an inverter circuit having an input terminal connected to said output circuitry and an output terminal for producing an output potential, the output potential of said inverter changing from a first to a second state for a potential at its input terminal traversing a threshold value, said circuitry further comprising:

potential offset means serially connected in said feedback loop, said potential offset means connected in the feedback loop at said output circuitry; and

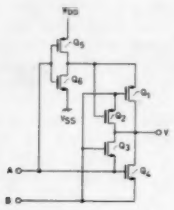
means for generating a current to bias said potential offset means to produce an offset potential equal to said inverter threshold level, said bias current varying in amplitude so that the offset potential produced thereby substantially tracks threshold potential drifts occurring in said inverter.

4,417,161

COMPLEMENTARY CHANNEL TYPE MOS TRANSISTOR EXCLUSIVE OR/NOR LOGIC GATE CIRCUIT

Masaru Uya, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 28, 1981, Ser. No. 297,501
Claims priority, application Japan, Sep. 4, 1980, 55-123154
Int. Cl.³ H03K *19/21, 19/094*
U.S. Cl. 307—471 **3 Claims**



1. A complementary transistor type logic gate circuit comprising:

a first input terminal to which a first input signal is applied,

a second input terminal to which a second input signal is applied,

an output terminal,

an inverter

a first transistor and a second transistor of one conductivity type having gate, source and drain electrodes,

a third transistor and a fourth transistor of a complementary conductivity type having gate, source and drain electrodes,

said inverter being operatively connected to invert said first input signal and issue outputs to a source of said transistor and to a gate of said second transistor,

said first input terminal being operatively connected to a source of said third transistor and a gate of said fourth transistor,

said second input terminal being operatively connected to a gate of said first transistor, a source of said second transistor, a gate of said third transistor and a source of said fourth transistor, and

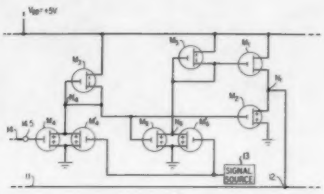
all drains of said first, second, third and fourth transistors being connected in common to said output terminal.

4,417,162

TRI-STATE LOGIC BUFFER CIRCUIT

Jack K. Keller, Macungie, and Gilbert L. Mowery, Jr., Allentown, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 2,741, Jan. 11, 1979, abandoned. This application Sep. 9, 1981, Ser. No. 300,590
Int. Cl.³ H03K *19/003, 19/094, 19/173, 19/20*
U.S. Cl. 307—473 **9 Claims**



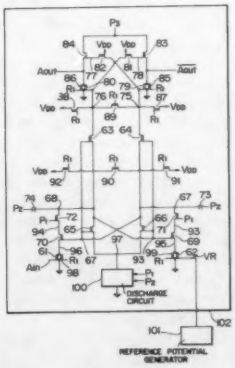
1. A tri-state MOS buffer circuit comprising first and second NOR-gates, respectively, responsive to input logic signals, and having first and second output nodes, respectively, connected to first and second input nodes, respectively, of an output MOS load device (M_1, M_2); said load device including a first MOS enhancement transistor (M_1), having a relatively low threshold voltage under zero back-gate bias, whose high current path is connected in series with that of an output MOS enhancement mode driver transistor (M_2), having a relatively high threshold voltage under zero back-gate bias, and wherein the series connection of said output MOS transistors is used to effect an output node connection; each NOR-gate including a relatively low β MOS depletion mode load transistor (M_3; M_5) each separately connected in series with a separate pair of relatively high β MOS enhancement mode driver transistors (M_4, M_4'; M_6, M_6') connected in parallel with each other.

4,417,163

BUFFER CIRCUITS

Yoshio Otsuki; Masaru Uesugi, both of Tokyo, and Nobuaki Ieda, Kodaira, all of Japan, assignors to Oki Electric Industry Co., Ltd. and Nippon Telegraph and Telephone Public Corporation, both of Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 235,035
Claims priority, application Japan, Feb. 20, 1980, 55-19042
Int. Cl.³ H03K *19/092, 17/693;* **G11C** *8/00*
U.S. Cl. 307—475 **8 Claims**



1. A buffer circuit comprising:

a flip-flop circuit including a first MOS transistor having source and gate electrodes, and a drain electrode coupled to a first input/output terminal, and a second MOS transistor having a drain electrode coupled to said gate electrode of said first MOS transistor and a second input/output terminal and having a source electrode coupled to said source electrode of said first MOS transistor and having a gate electrode coupled to said first input/output terminal;

a discharge circuit connected between the commonly connected source electrodes of said first and second MOS transistors of said flip-flop circuit and a first fixed source potential for discharging said source electrodes when a first start signal or a second start signal is inputted;

first and second capacitors for respectively AC coupling said first and second start signals to said first and second input/output terminals of said flip-flop circuit;

a first transfer gate circuit for executing a NOR logic function between a TTL level address input signal and a reset signal;

a second transfer gate circuit for executing a NOR gate logic function between said reset signal and a reference signal applied to a reference potential terminal;

a third transfer gate circuit coupled between an output terminal of said first transfer gate circuit and said first input-/output terminal of said flip-flop circuit for selectively transmitting an output signal of said first transfer gate circuit to said first input/output terminal in accordance with a potential at said second input/output terminal of said flip-flop circuit and a first start signal;

a fourth transfer gate circuit coupled between an output terminal of said second transfer gate circuit and said second input/output terminal for selectively transmitting an output of said second transfer gate circuit to said second input/output terminal in accordance with a potential at said first input/output terminal of said flip-flop circuit and said first start signal;

said first to fourth transfer gate circuits, said discharge circuit, said first and second capacitors and said flip-flop circuit constituting a sensing and amplifying circuit;

a fifth transfer gate circuit coupled between a first MOS level address signal output terminal and said first fixed source potential for executing a NOR logic function between a potential at a third input terminal and said reset signal;

a sixth transfer gate circuit coupled between a second MOS level address signal output terminal and said first fixed source potential for executing a NOR logic function between a potential at a fourth input terminal and said reset signal;

a first bootstrap circuit for selectively raising a potential at said first MOS level address signal output terminal according to a signal applied to said fourth input terminal and a third start signal;

a second bootstrap circuit for selectively raising a potential at said second MOS level address signal output terminal in accordance with a signal applied to said third input terminal and said third start signal;

said first and second bootstrap circuits constituting an output transmission circuit;

a seventh transfer gate circuit coupled between said third input terminal and said first input/output terminal of said flip-flop circuit and selectively enabled and disabled by a potential at said second input/output terminal of said flip-flop circuit;

an eighth transfer gate circuit coupled between said fourth input terminal and said second input/output terminal of said flip-flop circuit and selectively enabled and disabled by a potential at said first input/output terminal of said flip-flop circuit;

a first precharge circuit for charging said first and second input/output terminals of said flip-flop circuit by said reset signal;

a second precharge circuit for charging said third and fourth input/output terminals by said reset signal; and

a reference potential generator for applying a reference potential to said reference potential terminal of said second transfer gate circuit of said sensing and amplifying circuit.

4,417,164

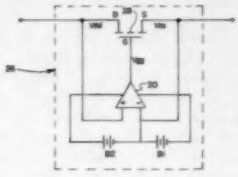
MECHANICAL VALVE ANALOG

Carl E. Edlund, Castroville, Tex., assignor to Southern Gas Association, Dallas, Tex.

Filed Jun. 18, 1981, Ser. No. 275,068

Int. Cl.[3] **H03K** *4/00, 5/153, 3/26*

U.S. Cl. 307—497 **1 Claim**



1. An apparatus for electrically simulating, in an electrical analog of a fluid pump, the action of a unidirectional mechanical valve, comprising:

an input terminal which corresponds to the input of the mechanical valve;

an output terminal which corresponds to the output of the mechanical valve;

a field effect transistor having a gate, a drain and a source, wherein the drain and source are coupled to said input and output terminals;

a voltage comparator having a positive input coupled to said input terminal, a negative input coupled to said output terminal, and an output coupled to the transistor gate; and

a voltage supply having positive, negative and middle supply outputs, wherein the positive supply output is coupled only to a positive supply terminal of said comparator, and further wherein the negative supply output is coupled only to a negative supply terminal of said comparator, and further wherein the middle output is coupled only to the comparator negative input, whereby said voltage supply is referenced to whatever voltage may be present at said output terminal.

4,417,165

MUTING CIRCUIT

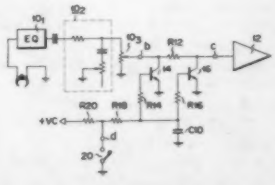
Kenji Fujibayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 118,996, Feb. 6, 1980, abandoned. This application May 21, 1982, Ser. No. 380,950

Claims priority, application Japan, Mar. 26, 1979, 54-38924[U]

Int. Cl.[3] **H03K** *5/00, 17/60*

U.S. Cl. 307—540 **3 Claims**



1. A muting circuit comprising:

an input circuit which receives an input signal of the muting circuit and provides a first signal corresponding to said

input signal, said input circuit having a given circuit impedance;

a volume control circuit having a given circuit impedance, which is provided with an input terminal for receiving said first signal, an output terminal for providing a second signal and a ground terminal coupled to a circuit with zero AC potential, a ratio between the magnitude of said second signal to that of said first signal being varied under control of said volume control circuit;

an impedance element having two terminals, one terminal of which is coupled to the output terminal of said volume control circuit and the other terminal of which provides an output signal of said muting circuit;

a first bipolar transistor which has a collector coupled to the one terminal of said impedance element and an emitter coupled to said zero AC potential circuit;

a second bipolar transistor which has a collector coupled to the other terminal of said impedance element and an emitter coupled to said zero AC potential circuit; and

muting signal supply means coupled to each base of said first and second transistors for simultaneously supplying a DC muting signal, said muting signal supply means including a first resistor connected at one end to a base of said first transistor, and a second resistor connected at one end to a base of said second transistor, the other ends of said first and second resistors being connected to each other, and the resistance values of said first and second resistors being so selected that said first and second transistors are turned on substantially at the same time when said muting signal is supplied thereto.

4,417,166

STATOR FOR A STEPPING MOTOR

Norberto Perucchi, St. Blaise, and Elmar Mock, Bienne, both of Switzerland, assignors to ETA A.G. Ebauches-Fabrik, Solothurn, Switzerland

Division of Ser. No. 124,275, Feb. 25, 1980, Pat. No. 4,312,119. This application Jul. 28, 1981, Ser. No. 287,829

Claims priority, application Switzerland, Feb. 27, 1979, 1931/79

Int. Cl.³ H02K *37/00*

U.S. Cl. 310—49 R **6 Claims**

1. A stepping motor for an electronic watch having a stator comprising a one-piece core of ferromagnetic metal including widened end portions having opposed faces and a center portion of rectangular cross-section coupled between said widened end portions, an elongated coil formed about said center portion such that said center portion passes axially through said coil, and two pole pieces coupled magnetically to said widened end portions by overlapping surface contact, wherein the improvement comprises:

a film of resin covering said center portion and one face of each of said widened end portions and forming reinforced zones of resin along edges of said core of rectangular cross-section, said coil being formed about said center portion such that turns of said coil rest directly upon said film.

4,417,167

DC BRUSHLESS MOTOR

Hirohisa Ishii, Tokyo; Masami Shishikura, Yokohama, and Toshihiko Okamura, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 942,270, Sep. 14, 1978, abandoned. This application Dec. 11, 1981, Ser. No. 329,887

Claims priority, application Japan, Sep. 14, 1977, 52-111298

Int. Cl.³ H02K *7/00*

U.S. Cl. 310—67 R **20 Claims**

1. In a DC brushless motor including a permanent magnet rotor assembly, a stator assembly having stator coils arranged in the magnetic field generated by said permanent magnet rotor assembly, and means for controlling energization of said stator coils so as to impart a rotational torque to said rotor assembly; said rotor assembly comprising a plurality of flat permanent magnets each having a flat side facing said stator coils across an air gap free of magnetic material and rotor yoke means having a substantially polygonal cross-section and a plurality of flat side walls to which said flat permanent magnets are attached and providing a path for magnetic flux emanating from the side of said magnets remote from said stator coils whereby said plurality of magnets forms an array thereof which is substantially a regular polygon in cross-section.

4,417,168

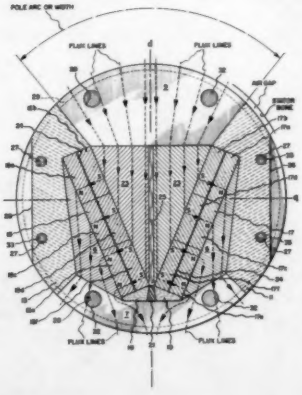
PERMANENT MAGNET ROTOR FOR A DYNAMO ELECTRIC MACHINE

Timothy J. E. Miller, Schenectady, and Donald W. Jones, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 26, 1981, Ser. No. 315,333

Int. Cl.³ H02K *21/12*

U.S. Cl. 310—156 **14 Claims**



1. A two pole permanent magnet rotor for a dynamo electric machine comprising:

two pole pieces of magnetic material;

two non-magnetic segments separating said pole pieces and

forming a cylinder, said cylinder having an aperture extending axially through the central portion thereof;

two magnets arranged in a "V" configuration polarized such that the inner faces of said "V" configuration magnets have like polarity, said magnets located in the aperture symmetrically about the d axis and asymmetrically located above and below the q axis, the q axis passing through the center of said cylinder and orthogonal to the d-axis;

means for holding said magnets in said aperture such that the outer faces of said "V" configuration magnets are adjacent to one of said pole pieces and for conducting flux between the inner magnet faces and the other of said pieces, said means for holding said magnets in the aperture comprising a prism of magnetic material positioned adjacent to the inner face of said "V" configuration magnets, said prism including said first and second prism sections separated along a plane parallel to a flux line, and a planar spring disposed between said sections; and

shaft means attached to both faces of said cylinder.

4,417,169

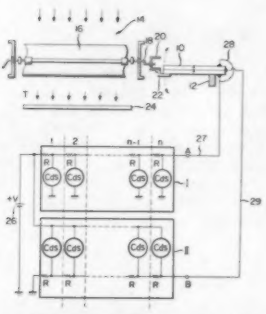
PHOTOELECTRIC DRIVE CIRCUIT FOR A PIEZOELECTRIC BIMORPH ELEMENT

Minoru Toda, and Susumu Osaka, both of Machida, Japan, assignors to RCA Corporation, New York, N.Y.

Filed Feb. 11, 1982, Ser. No. 347,975

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—317 **5 Claims**



1. A photoelectric circuit arrangement for driving a piezoelectric bimorph element comprising:

a direct current voltage source having first and second terminals,

a first resistive means connected beween said first source terminal and a first output terminal,

a first photoconductive means connected between said second source terminal and distributed points along said first resistive means,

a second resistive means connected between said second source terminal and a second output terminal,

a second photoconductive means connected between said first source terminal and distributed points along said second resistive means, and

means connecting said first and second output terminals to said bimorph element.

4,417,170

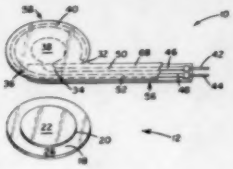
FLEXIBLE CIRCUIT INTERCONNECT FOR PIEZOELECTRIC ELEMENT

Timothy C. Benincasa, Bellevue, Ohio, assignor to Imperial Clevite Inc., Rolling Meadows, Ill.

Filed Nov. 23, 1981, Ser. No. 323,913

Int. Cl.³ H01L *41/04*

U.S. Cl. 310—345 **3 Claims**



1. A piezoelectric assembly comprising:

a piezoelectric element and a flexible interconnect for attachment to said element; said interconnect including an insulating base and spaced circuit traces laminated to said base in operation with electrical connection to said element, said element being generally disc-shaped and including a face for said attachment, said face being operatively connected to a first of said traces about a segment of the periphery of said face and operatively connected to a second of said traces generally centrally of said face, an insulating overlay sealing said circuit traces which are not electrically connected to the element, and means for connecting said traces to an electrical circuit.

4,417,171

ROTARY ANODE X-RAY TUBE

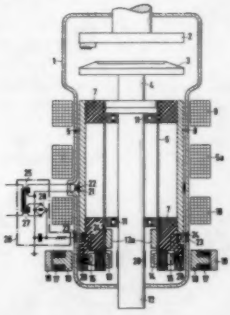
Herbert Schmitmann, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 15, 1981, Ser. No. 311,622

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3043046

Int. Cl.³ H01J *1/10, 61/52*

U.S. Cl. 313—16 **5 Claims**

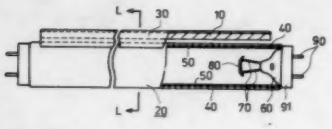


1. A rotary anode x-ray tube comprising an anode arrangement **(3, 4, 5)** mounted magnetically for rotation with respect to an anode rotary axis without contact, including an anode **(3)** and a part **(5)** rotating with the anode **(3)**, a stationary part **(12)**, and means **(12, 13, 14, 20)** for carrying off the anode current comprising at least one auxiliary cathode **(13, 14)** arranged on said part **(5)** rotating with the anode **(3)**, and an auxiliary anode **(20)**, arranged concentrically to the anode rotary axis on the stationary part **(12)**, and operatively associated with said auxiliary cathode.

4,417,172
LOW PRESSURE DISCHARGE LAMP

Makoto Touhou, Yawata; Shigeaki Wada, Osaka, and Minoru Yamamoto, Neyagawa, all of Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed Dec. 12, 1980, Ser. No. 215,664
Claims priority, application Japan, Dec. 29, 1979, 54-171283; Dec. 29, 1979, 54-171293; Oct. 8, 1980, 55-141314
Int. Cl.³ H01J 1/50
U.S. Cl. 313—156 6 Claims



1. A low pressure discharge lamp apparatus comprising:

a low pressure discharge tube, having electrodes on both ends thereof and containing therein mercury and a rare gas, and

a magnetic field generating means disposed along said low pressure discharge tube for applying a static magnetic field such that its magnetic field crosses the electric field induced in said discharge tube when lit, for a range over substantially the entire length of a positive column induced in said discharge tube, wherein:

the value X of the quotient obtained by dividing the weighted mean value of the atomic weight of rare gas atoms in said discharge tube by a product of the pressure value in the tube, the square of the value of the inner radius of said discharge tube, and length of the tube, and

the value Y of the applied magnetic flux density at the center of a transverse section of said discharge tube,

have a relationship defined by the expression:

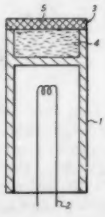
$$600X+70>Y>630X-20(X>0,\ Y>0)$$

in which the ambient temperature of said discharge tube is 0° C. and the power source voltage actually supplied is 90% of the scheduled standard power source voltage.

4,417,173
THERMIONIC ELECTRON EMITTERS AND METHODS OF MAKING THEM

Richard A. Tuck, Slough, and Heather B. Skinner, London, both of England, assignors to E M I-Varian Limited, Hayes, England

Filed Mar. 6, 1981, Ser. No. 241,037
Claims priority, application United Kingdom, Dec. 9, 1980, 8039472
Int. Cl.³ H01J 1/14
U.S. Cl. 313—346 R 14 Claims



1. A thermionic electron emitter comprising at least an emissive surface layer formed predominantly of a σ phase alloy selected from the group of σ phase alloys consisting of:

Mo/Os	54–44% Mo	46–56% Os
Ir/Ta	17–38% Ir	83–62% Ta
W/Re	54–35% W	46–65% Re
Nb/Rh	69–58% Nb	31–42% Rh
Nb/Ir	29–25% Nb	71–75% Ir
Rh/Ta	15–26% Rh	85–74% Ta

and an alkaline earth activator.

4,417,174
ELECTROLUMINESCENT CELL AND METHOD OF PRODUCING THE SAME

Yoshimi Kamijo, and Kazuhiko Kawachi, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

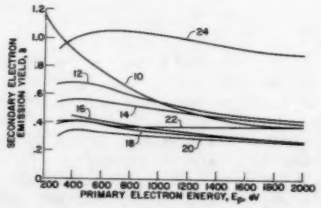
Filed Oct. 2, 1981, Ser. No. 307,885
Claims priority, application Japan, Oct. 3, 1980, 55-138423; Dec. 12, 1980, 55-175452
Int. Cl.³ H01J 1/62, 63/04
U.S. Cl. 313—502 3 Claims

1. In an electroluminescent cell wherein a luminescent layer and an insulating layer lie between a transparent electrode and a counter electrode; an electroluminescent cell characterized in that said luminescent layer is made of a copolymer of vinylidene fluoride and propylene hexafluoride with phosphorescent powder dispersed therein.

4,417,175
ION SPUTTER TEXTURED GRAPHITE ELECTRODE PLATES

Arthur N. Curren, North Ridgeville; Ralph Forman, Rocky River; James S. Sovey, Strongsville, and Edwin G. Wintucky, Lakewood, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 264,378, May 15, 1981, Pat. No. 4,349,424.
This application Mar. 31, 1982, Ser. No. 364,072
Int. Cl.³ H01J 23/02
U.S. Cl. 315—5.38 4 Claims



1. In a multistage depressed collector having a retarding electric field for slowing charge particles prior to being collected, the improvement comprising

a plurality of pyrolytic graphite electrode plates adjacent to said beam for intercepting said slowed charged particles, each of said plates having a textured surface comprising a dense array of spires, each having a diameter less than

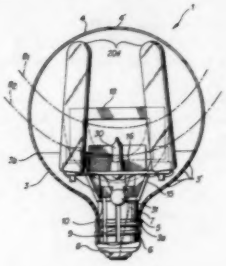
about 1 micron and a height between about 5 microns and about 10 microns to attain low secondary emission yields of about 0.3 and reduced numbers of reflected primary electrons.

4,417,176

COMPACT FLUORESCENT LAMP

Taketo Kamei; Motokazu Hayashi; Kimio Osada, all of Yokosuka, and Mitsutoshi Kimura, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 22, 1981, Ser. No. 285,731
Claims priority, application Japan, Jul. 28, 1980, 55-103338
Int. Cl.³ H01J *17/34, 7/44, 5/50*
U.S. Cl. 315—59 **1 Claim**



1. A compact flurorescent lamp comprising:
a chassis member;
a screw base secured to said chassis member;
a base member attached to said chassis member;
a winding envelope formed by bending a straight glass tube into a U-shape, thereby comprising a first bent part and a pair of first leg parts and bending each of said first leg parts into a second U-shape, thereby comprising a pair of second bent parts and two pairs of second leg parts;
a ballast disposed between said first bent part and said second end parts of said winding envelope; and
a globe member attached to said base member.

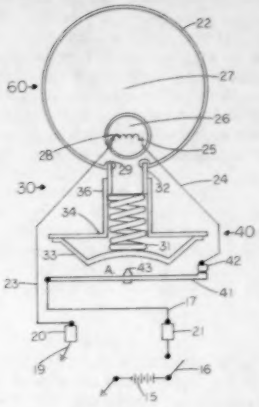
4,417,177

LAMP CONTROL DEVICE

Joseph C. Damiano, 4931 E. Acoma Dr., Scottsdale, Ariz. 85254

Filed Feb. 23, 1982, Ser. No. 351,415
Int. Cl.³ H05B *37/00*; H01J *7/44*
U.S. Cl. 315—73 **5 Claims**

1. In an electric lamp device comprising an inner envelope enclosing lamp heater means for converting electrical energy into visible light mounted inside an evacuated sealed outer envelope,
lamp circuit connector means for connection of said lamp heater means to an electrical voltage generating means,
detector envelope means connected to said outer envelope for controlling the operation of said lamp heater means, wherein said detector means is a pressure sensitive means responsive to said vacuum and external pressure,
lamp circuit cutout means connected between said lamp heater means and said lamp circuit connector means under



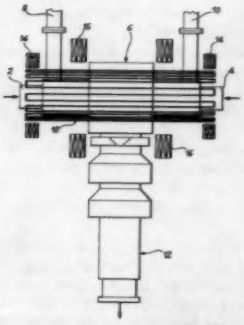
the control of said detector envelope means for controlling the lamp circuit.

4,417,178

PROCESS AND APPARATUS FOR PRODUCING HIGHLY CHARGED LARGE IONS AND AN APPLICATION UTILIZING THIS PROCESS

Richard Geller, 4, place Grenette, 3800 Grenoble, and Francis Gugliermotte, 1, boulevard Jomardiere, 38120 Saint Egreve, both of France

Continuation of Ser. No. 229,178, Jan. 28, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,645
Claims priority, application France, Feb. 13, 1980, 80 03153
Int. Cl.³ H01J *7/24*
U.S. Cl. 315—111.81 **5 Claims**



1. A process for producing highly charged ions comprising the steps as follows:
introducing a gas of neutral atoms into an ultra-high frequency cavity having electrically conducting walls enclosing an interior space and means for maintaining a vacuum therein, said cavity having an axis passing therethrough between the wall portions thereof;
exciting said cavity by at least one ultra-high frequency electromagnetic field having a given frequency,
applying to said cavity a multipole radial magnetic field having a minimum value in a central part of said cavity and an axial magnetic field having a gradient along said axis, said gradient being such as to inhibit ions from pro-

ceeding from the midportion of the interior of said cavity to at least one of said end wall portion of said cavity, said magnetic fields forming a resultant magnetic field having a value corresponding to a given electronic cyclotron frequency in the interior of said cavity,

modifying the value of said resultant magnetic field in such a way that in said cavity there is at least one closed shell of substantially uniform magnetic field strength having no contact with said cavity walls, while at said shell said electronic cyclotron frequency is equal to said frequency of said exciting electromagnetic field, whereby ions and electrons are produced by ionization of the gas passing through said shell and said electrons and said ions are substantially confined in a zone defined within said shell,

extracting said ions by means of electrodes at an exit from said cavity positioned in the vicinity of said shell and having no contact with said shell, and

selectively sorting said ions with reference to their charge.

4,417,179

LIGHT QUANTITY CONTROL DEVICE

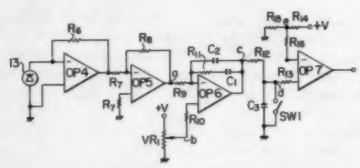
Takashi Fujimura, Mobara, and Kazuo Kato, Kitahassakumachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 7, 1982, Ser. No. 376,030

Claims priority, application Japan, May 8, 1981, 56-68302

Int. Cl.³ H05B *37/02*

U.S. Cl. 315—151 **4 Claims**



1. A light quantity control device for controlling the quantity of light emitted from a light source supplied with a.c. power through a switching element having a bidirectional controlled rectifier, comprising:

a light receiving element for converting light from said light source into an electric signal;

a processing circuit for processing said electric signal to generate an output signal corresponding to said electric signal;

a first integrating circuit for integrating said output signal from said processing circuit to produce a light quantity signal, said light quantity signal having varied in accordance with a change in quantity of light emitted from said light source;

a second integrating circuit for integrating said light quantity signal with a predetermined period; and

a comparing circuit for comparing an output signal of said second integrating circuit with a reference signal to produce a control signal for said switching element in accordance with a result of comparison.

4,417,180

LAMP FIRING APPARATUS

Morteza M. Chamran, Elmhurst, and Milan Dimovski, Countryside, both of Ill., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 5, 1981, Ser. No. 240,650

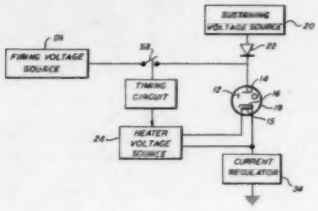
Int. Cl.³ H05B *41/23*

U.S. Cl. 315—175 **9 Claims**

9. A method for firing a discharge lamp without generating excessive transients comprising the following steps:

applying a voltage across said lamp having a potential less than the firing voltage;

raising said voltage at a gradual rate until said lamp fires;



applying a sustaining voltage to said lamp;

removing said voltage after applying said sustaining voltage and after said lamp fires.

4,417,181

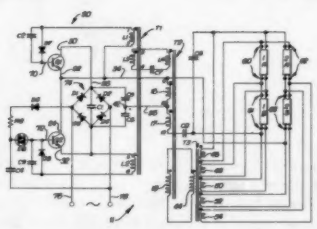
ELECTRONIC BALLAST

Luis Leale, San Diego, Calif., assignor to Sonelt Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 55,239, Jul. 6, 1979, abandoned. This application Jun. 23, 1980, Ser. No. 159,903

Int. Cl.³ H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—209 R **12 Claims**



1. An electronic ballasting system for illuminating electrical lamps comprising:

a main power transformer having a primary winding and at least a first secondary winding,

an electronic inverter coupled to drive current through said main power transformer primary winding sequentially in alternating directions characterized in that said electronic inverter has first and second transistors with the emitter of said first transistor coupled to the collector of said second transistor,

and further comprising a pair of d.c. supply lines, one of which is coupled to the collector of said first transistor and the other of which is coupled to the emitter of said second transistor,

a pair of charging capacitors series connected across said d.c. supply lines each coupled to at least partially turn on a single one of said transistors,

a lead connecting said emitter of said first transistor to said main power transformer primary winding, and a lead connecting said main power transformer primary winding to a tap between said charging capacitors,

means for driving said transistors in alternating sequence,

a starting circuit for initially driving said electronic inverter and further characterized in that said starting circuit initially drives one of said transistors,

an operating capacitor connected to said main power transformer first secondary winding,

at least first and second lamp terminal means for receiving electrical discharge lamps having cathode elements therein,

said lamp terminal means being series connected to said operating capacitor and to said main power transformer first secondary winding, and

a high impedance capacitor connected in parallel across at least one and less than all of said terminal means.

4,417,182

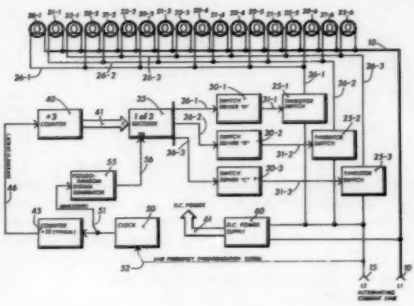
MOVING FLUTTER ILLUSION ELECTRIC LIGHT CONTROLLER

Harold J. Weber, 20 Whitney Dr., Sherborn, Mass. 01770

Filed Aug. 4, 1980, Ser. No. 174,913

Int. Cl.³ H05B *37/02, 39/04*

U.S. Cl. 315—210 **19 Claims**



1. Electric controller means adapted for imparting the visual sense of illusory motion of an electric lighting means combined with the further visual sense of the flickering of the electric lighting elements, including in combination:

a. a source of electric power;

b. a plurality of electric lighting load circuit means usually arranged with seriate adjacency;

c. a plurality of electric switch means each of which is effectively coupled between said source and effectively one of the said plurality of circuit load means;

d. a source producing a plurality of sequential pulse first signals;

e. a source of pseudorandom pulse second signals; and,

f. a unitive means coupled at least with said first signal source and said second signal source to effectively combine the plural sequential pulses and the pseudorandom pulses therefrom received into a plurality of separately efficacious variative control pulse signals each of which couples with an effectively separate said electric switch means to effect the control thereof.

4,417,183

INCANDESCENT LAMP DRIVER CIRCUIT

Earl E. Popard, LaPuente; Michael F. Sedlar, Walnut, and Gary W. Davidson, Upland, all of Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 1, 1982, Ser. No. 394,062

Int. Cl.³ H05B *39/02*

U.S. Cl. 315—291 **7 Claims**

1. Apparatus for supplying electrical energization to an incandescent lamp comprising:

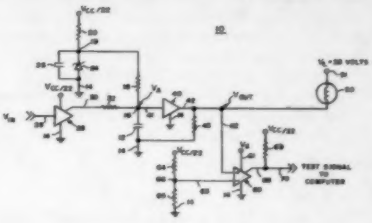
(a) a capacitor connected between a junction point and ground;

(b) first resistor means connected between said junction point and a source of reference voltage;

(c) first electronic switch means having a ground connection and including means for responding to an "on" signal applied to an input thereof for causing said switch means to have an "open" state at an output thereof and means for responding to an "off" signal for causing said switch means to have a "closed" state, i.e., said output being connected to said ground connection;

(d) means connecting the output of said first electronic switch means to said junction point; and

(e) second electronic switch means having a ground connection, an input and an output, said input being connected to said junction point, and said output being connected via an incandescent lamp, to a source of lamp energizing voltage, said second electronic switch means having an "open" state when no signal is applied to said input thereof, and a



"closed" state, i.e., said output being connected to ground through said ground connection when a signal is applied to said input thereof,

whereby when an "on" signal is applied to the input of said first electronic switch means, said capacitor means begins charging through said first resistor means toward the voltage of said source of reference voltage, to thereby apply a signal to the input of said second electronic switch means so as to cause a connection to be established between the output thereof and ground so that current begins to flow through said incandescent lamp.

4,417,184

PICTURE IMAGE DISPLAY APPARATUS

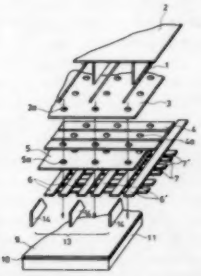
Yoshinobu Takesako, Neyagawa; Masanori Watanabe, Katano, and Kinzo Nonomura, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 3, 1981, Ser. No. 250,714

Claims priority, application Japan, Aug. 4, 1980, 55-110896[U]

Int. Cl.³ H01J *29/70, 29/72*

U.S. Cl. 315—366 **6 Claims**



1. A picture image display apparatus comprising:

a flat type vacuum enclosure having a transparent face panel,

a row of linear thermionic cathodes disposed in parallel,

electron beam forming electrode for producing a predetermined number of two dimensionally disposed electron beams out of the electron emission from said linear thermionic cathodes,

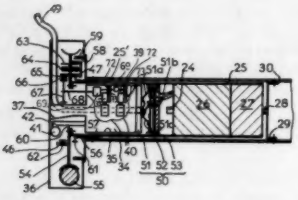
a row of cntrol electrodes disposed in parallel in a direction perpendicular to those of said linear thermionic cathodes,
a row of deflection electrodes,
a phosphor screen formed on the inner face of said face panel, and
an anode of thin metal film formed on the surface of said phosphor screen,
wherein the improvement is that
(i) a row of deflection-aiding electrodes is disposed between said row of deflection electrode and said anode,
(ii) said deflection-aiding electrodes are provided with cut out portions on the side of said face panel so as to provide gaps 1 to 10 times the thickness of said deflectioin-aiding electrode, between lower edge of said deflection-aiding electrode and the surface of said anode, and
(iii) said deflection electrodes are adapted for impressing substantially constant positive potential with respect to said linear thermionic cathodes.

4,417,185

DRIVING SYSTEM FOR ROLL-UP SHADES, BLINDS, ROLLING SHUTTERS AND THE LIKE

Jean Bullat, Bonneville, France, assignor to Somfy, France

Filed Mar. 27, 1981, Ser. No. 248,223
Claims priority, application France, Apr. 18, 1980, 80 09168
Int. Cl.³ H02K *7/00*
U.S. Cl. 318—2 **8 Claims**



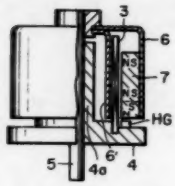
1. A driving system for roll-up shades comprising a rotatable winding tube on which the shade is wound, a tubular casing concentrically disposed in an end portion of the winding tube, an electric motor mounted in said tubular casing and having a shaft, first coupling means kinematically coupling said motor shaft with said winding tube to drive said winding tube in rotation relative to said tubular casing when said motor is energized and to fix said winding tube relative to said tubular casing when said motor is deenergized, manually operable means for rotating said tubular casing to rotate said winding tube when said motor is deenergized, said manually operable means comprising a drive wheel having a flange portion fixed to said tubular casing at an outer end thereof, a stationary housing for said drive wheel, rotary collector means for supplying energizing current to said motor, said rotary collector means being disposed in said tubular casing and comprising a rotatable portion fixed to said tubular casing and a stationary portion connected with said stationary housing, circuit means connecting said rotary collector means with said motor, said circuit means including automatic stop means for cutting off the supply of energizing current to said motor when said shade is fully wound on said winding tube or is fully unwound, said automatic stop means being disposed in said tubular casing and comprising a stationary member connected with said stationary housing and a movable member, and second coupling means coupling said movable member of said automatic stop means kinematically with said winding tube, said second coupling means comprising component elements disposed on opposite sides of said flange portion of said drive wheel in close vicinity thereof and means kinematically connecting said component elements with one another.

4,417,186

COMMUTATORLESS ELECTRICAL MOTOR HAVING SUB MAGNETIC POLES

Yukimi Hirose, Atsugi; Ken Enami, Kawasaki, and Kinzo Wada, Yokohama, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jan. 12, 1982, Ser. No. 338,997
Claims priority, application Japan, Jan. 13, 1981, 56-2415[U]
Int. Cl.³ H02K *29/02*
U.S. Cl. 318—254 **5 Claims**



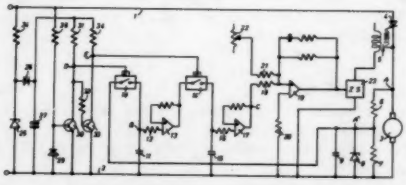
1. A commutatorless electrical motor comprising:
(a) a stator equipped with polyphase armature windings;
(b) a cylindrical rotor having main magnetic poles including rotation driving magnets which have been formed by magnetization in such a manner that N and S poles are alternately arranged in the circumferential direction, and an axis passing through the N and S poles of each magnet extends radially;
(c) a plurality of sub magnetic poles which have been formed on one end of said rotor by magnetization in such a manner that an axis passing through N and S poles thereof extends axially and that the magnetized area angle thereof with respect to the center axis of said rotor is much smaller than that of the main magnetic poles and is smaller than $\pi/2$ radian in an electrical angle;
(d) a plurality of rotational position detecting elements provided for detecting the position of said sub magnetic poles of said rotor; and
(e) current switching means for changing over the currents flowing through said polyphase armature windings in accordance with signals from said plurality of rotational position detecting elements.

4,417,187

CIRCUIT FOR CONTROLLING THE SPEED OF A MOTOR

Gediminas Bateika, Karlsruhe, Fed. Rep. of Germany, assignor to Pfaff Haushaltmaschinen GmbH, Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 324,074
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049022
Int. Cl.³ H02P *5/12*
U.S. Cl. 318—331 **4 Claims**



1. A circuit for controlling the speed of a motor having a constant magnetic field and supplied from an alternating current source having a line frequency through a controllable semiconductor rectifier, in which a generator action voltage corresponding to the speed of the motor controls the operating

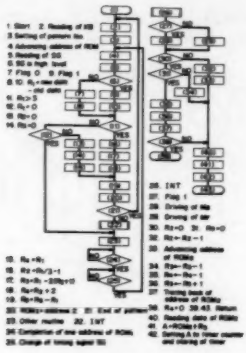
time of the semiconductor rectifier, comprising two series connected switches for receiving the generator action voltage which are controlled in phase opposition by the line frequency, a voltage storage unit following each switch, a controller having an input connected to the output of the last storage unit in the series connected switches, the controller having an output, and a firing stage connected to the semiconductor rectifier for turning the semiconductor rectifier ON connected to the output of the controller.

4,417,188

PULSE MOTOR DRIVING SYSTEM

Hachiro Makabe, Kanagawa; Harahiko Tanaka, Mitaka, and Akira Orii, Sagamihara, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Oct. 14, 1981, Ser. No. 311,303
Claims priority, application Japan, Oct. 16, 1980, 55-144706
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **1 Claim**



1. A pulse motor driving system, comprising a memory storing data for controlling time intervals between the adjacent pulses produced in a series to steppingly drive a pulse motor; means for designating a number of stepping pulses in a section from start to stop of the pulse motor; calculating means dividing the designated number of stepping pulses into a predetermined number of parts, said calculating means controlling the read-out order of the time interval control data in each of the divided parts of pulses to thereby repeatedly use the data to control the time intervals between the pulses in these divided parts, said calculating means being operated in accordance with calculating formulas in the form of functions of the number of stepping pulses, each being specific to the divided parts of pulses so as to modify the data read out to control the pulses in these divided parts; and pulse generating means operated in response to the output data of the calculating means to determine the time intervals of the pulses; said calculating means being operated in accordance with the calculating formulas to progressively increase and decrease the speed of pulses in the divided parts, said calculating formulas including coefficients to modify the degrees of progressive increase and decrease of the pulse speed in response to the number of stepping pulses.

4,417,189

CONTROL CIRCUIT FOR STEPPER MOTOR

Dennis O. Overfield, Fairfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 29, 1982, Ser. No. 344,247
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **6 Claims**

1. A stepping motor control circuit comprising, in combination:

a control signal source;

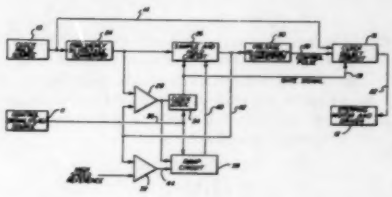
a source of clock pulses at a first pulse rate;

a voltage-to-frequency converter responsive to a voltage source for producing converter pulses at a rate controlled by said voltage source;

selecting circuit responsive to said control signal for coupling either said clock pulse source or said converter pulses to the stepping motor in response to said control signal changing from one state to another;

first control means, responsive to said control signal changing to the state where said converter pulses are gated to the stepping motor, for applying a gradually changing voltage to said voltage-to-frequency converter to cause the pulse frequency of the pulses produced thereby to start at the frequency of said clock pulses and rise gradually for a period of time T_2;

second control means responsive to the ending of the time period T_2 to gradually change the voltage at the input to said voltage-to-frequency converter to cause the pulse



rate produced by said voltage-to-frequency converter to rise gradually at a rate different from the rate of frequency change during time period T_2;

third control means responsive to the voltage at the input to said voltage-to-frequency converter for maintaining said input voltage at a constant value once that value is reached, said input voltage remaining at said constant value until said control signal changes state;

fourth control means responsive to said control signal changing state to gradually change the voltage at the input to said voltage-to-frequency converter so as to cause the pulse frequency produced thereby to change from that produced by said constant value voltage until the frequency is the same as produced by said clock pulse source; and

fifth control means responsive to the pulse rate at the output of said voltage-to-frequency converter reaching that of said clock pulse source to actuate said selecting circuit to again apply said clock pulses to the stepping motor.

4,417,190

CONTROL SYSTEM FOR AN INDUCTION MOTOR WITH ENERGY RECOVERY

Frank J. Nola, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 243,683, Mar. 16, 1981, and Ser. No. 297,524, Aug. 28, 1981. This application Feb. 19, 1982, Ser. No. 350,472
Int. Cl.³ H02P *5/40*
U.S. Cl. 318—729 **6 Claims**

1. A power control for an induction motor powered by an A.C. line, and operated in both motor and generating modes, comprising:

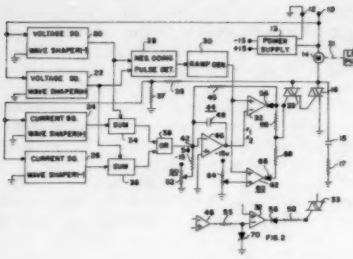
detection means responsive to motor voltage and current for providing an output signal proportional to the power factor of operation of said motor;

a power factor command signal;

summing means responsive to said power factor command signal and said output signal of said detection means for providing an error signal;

signal means responsive to said error signal for providing at least one pulse each half cycle of A.C., including a pulse each half cycle which has a leading edge which is variable in time as a function of said error signal;

control means connected to an A.C. line and responsive to



the pulse output of said signal means for turning on current flow to said motor in each half cycle of A.C. upon receipt of a first pulse received during that half cycle; and

second signal means in circuit with said signal means for limiting the latest time in a half cycle at which said first pulse is supplied to said control means.

4,417,191

METHOD AND CIRCUIT FOR D.C. BRAKING A THREE-PHASE ASYNCHRONOUS MACHINE

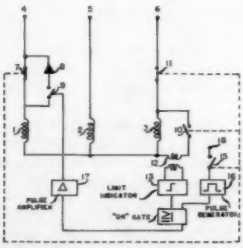
Helmut Schmidt, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 29, 1981, Ser. No. 268,161

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1980, 3020850

Int. Cl.³ H02P *3/24*

U.S. Cl. 318—760 **1 Claim**



1. In a circuit for the direct current braking of a three-phase synchronous machine having first, second, and third Y-connected stator windings adapted to be connected to a three phase power supply by causing direct current to flow in the first and second windings when braking and, at the same time, short-circuiting the third winding, the circuit comprising:

a parallel circuit coupling the first stator winding to a first phase of the power supply, the parallel circuit comprising a normally closed first switch and a rectifier valve connected in series with a normally open second switch,

a normally closed fourth switch coupling the third stator winding to a third phase of the power supply, and

a normally open third switch coupled across the third stator winding,

the first, second, third, and fourth switches each having an operating input,

the improvement comprising:

a current sensor coupled between the third switch and the third stator winding and having an output;

a limit indicator having an input coupled to the output of the current sensor and having an output;

a tripping switch having an output coupled to the operating input of the first, third and fourth switches and to the input of the pulse generator;

a pulse generator having an input and an output; and

a digital logic member having OR logic, the logic member having an input coupled to the output of the limit indicator, an input coupled to the output of the pulse generator, and an output coupled to the operating input of the second switch.

4,417,192

SECTIONAL MOTOR STARTING WINDING CIRCUIT FOR THREE-PHASE MOTORS

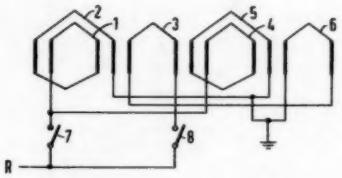
Shyamal-Krishna Ghosh, Bad Neustadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 27, 1982, Ser. No. 343,276

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107654

Int. Cl.³ H02P *1/42*

U.S. Cl. 318—797 **2 Claims**



1. In a sectional winding for a three phase motor, the motor having a number of pole pairs p which is equal to or greater than two and an uneven number of slots q, per pole and phase, which is greater than one and the motor having a single-layer winding which is divided into two winding sections for each phase, the winding sections of each phase adapted to be connected one after the other to the same phase of a supply network during start up of the motor, the improvement in which:

each section of the winding for a given phase comprises a plurality of coils, the section to be connected first comprising more than one-half of the coils for the given phase and comprising at least two branches each comprising a like plurality of coils connected in series, the branches connected together in parallel and the coils in each branch spaced apart 360° per pole pair;

the section which is to be connected later comprises at least one additional branch of a like plurality of coils connected in series, the additional branch is adapted to be connected in parallel to the first section; and

each branch in the winding has the same number of turns.

4,417,193

METHOD AND APPARATUS FOR CONTROLLING ALTERNATING CURRENT MOTORS

Akio Hirata, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 5, 1981, Ser. No. 290,195

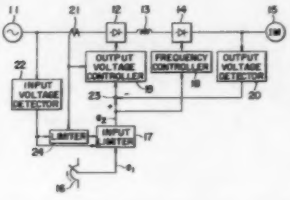
Claims priority, application Japan, Aug. 29, 1980, 55-118294

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—803 **6 Claims**

1. In a method of controlling a speed of an AC motor energized by a source of alternating current through a frequency converter wherein the speed of said AC motor is controlled by controlling a primary frequency and a primary voltage of said

AC motor with said frequency converter, said primary voltage is controlled by a closed loop including a minor loop, primary current of said AC motor is controlled by said minor loop and said primary frequency is controlled by an open loop, the improvement which comprises the steps of decreasing said primary frequency with said frequency converter at a rate faster than a rate of decrease in a number of revolutions of said



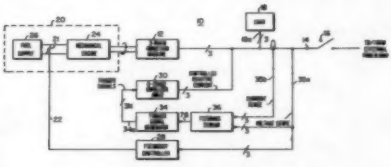
AC motor when said source of alternating current is interrupted and then recovered after a short interval, and accelerating said AC motor to an original speed with said primary current limited to a predetermined value smaller than a value limited by said minor loop while maintaining said primary frequency and said primary current in a predetermined relation.

4,417,194

INDUCTION GENERATOR SYSTEM WITH SWITCHED CAPACITOR CONTROL

William P. Curtiss, Winthrop, and Donald E. Fulton, Stoneham, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Sep. 18, 1980, Ser. No. 188,306
Int. Cl.³ H02P 9/46
U.S. Cl. 322—47 **58 Claims**



1. An induction generator system comprising:

A. an n-phase induction machine having an input shaft and at least n output lines, where n is an integer, wherein each output line is coupled to an associated output terminal,

B. means for generating a frequency control signal representative of the difference between the frequency of the voltage of at least one of said output terminals and a reference value,

C. torque generating means responsive to said frequency control signal for applying a torque to said input shaft, said applied torque being related to said frequency control signal,

D. an N-stage switched capacitor array, where N is an integer, each stage including n capacitor networks, each network being associated with a pair of said output lines, wherein the capacitor networks within each stage are each characterized by a predetermined capacitance for that stage, and wherein each of said capacitor networks includes an associated capacitor switch means, each switch means being responsive to a trigger signal for selectively coupling said capacitor network across its associated pair of output lines,

E. feedback means coupled to said output lines and including trigger means for generating said trigger signals,

wherein the capacitor networks of X of said N stages are characterized by binary weighted capacitance values from stage to stage, where X is an integer, and

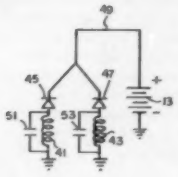
wherein the capacitor networks of N-X of said N stages are characterized by substantially equal capacitance values from stage to stage.

4,417,195

MAGNETO BATTERY TRICKLE CHARGER

John N. MacLeod, Ann Arbor, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Division of Ser. No. 190,899, Sep. 25, 1980, Pat. No. 4,383,214.
This application Nov. 24, 1982, Ser. No. 444,319
Int. Cl.³ H02J 7/00
U.S. Cl. 322—58 **1 Claim**



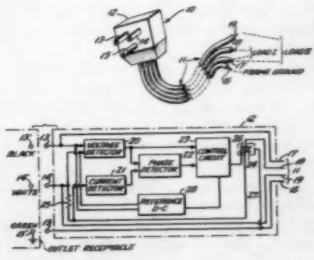
1. The method of providing periodic current surges to charge a storage battery in an internal combustion engine powered device having an engine flywheel with a single permanent magnet supported thereon and a high voltage ignition system having an ignition voltage induced therein by relative movement of the flywheel supported permanent magnet, the method comprising the steps of providing a charging coil about a magnetic core in which flux changes are normally occurring each time the permanent magnet passes the core as a part of the operation of the high voltage ignition system, connecting a capacitor directly in parallel with the charging coil of sufficient capacity relative to the charging coil to cause the current in the coil to lead the voltage thereacross so as to provide an increased effective charging current to the battery, and insuring that only unidirectional current flows from the parallel connected coil-capacitor circuit by an otherwise reactive component free path to the battery to thereby provide a single primary charging pulse to the battery during each revolution of the flywheel.

4,417,196

CORD SETS WITH POWER-FACTOR CONTROL

Agustin Cueto, Westport, Conn., and Daniel E. Robinson, Metuchen, N.J., assignors to GK Technologies, Incorporated, Greenwich, Conn.

Filed Dec. 10, 1981, Ser. No. 329,420
Int. Cl.³ G05F 5/00
U.S. Cl. 323—210 **6 Claims**



1. As an article of manufacture, an electrical cord set adapted for connection to supply a-c electric power to a utili-

zation device having two different electrical-system components one of which is phase-reactive to load, said cord set comprising a flexible cord having at least four insulated conductors adapted at one end for connection to said utilization device, and a plug unit connected to the other end of said cord, said plug unit having a body with a three-prong inlet-conductor cluster of standard configuration for removable insertion in a conventional single-phase a-c power-outlet receptacle, the standard three-prong configuration providing within said body an inlet-ground connection, an inlet-common connection and an inlet-hot connection, first, second and third of said cord conductors being respectively connected within said body to different inlet connections, and a power-factor controller within said body and having first and second inlet connections respectively connected to said inlet-common and to said inlet-hot connections, said power-factor controller having an output connection to the fourth of said insulated conductors, whereby a phase-reactive system component such as an induction motor may be connected to run under power-factor control via said third and fourth conductors while a differently reactive system component such as an electrical heater and its control circuitry may be connected to run without power-factor control via said second and third conductors.

4,417,197

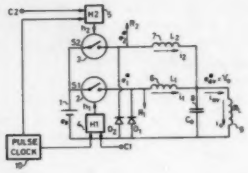
ELECTRONIC SYSTEM FOR SIMULTANEOUS CONTROL OF TWO OR MORE PULSE MODULATORS

Francisc C. Schwarz, Round Hill Rd., Lincoln, Mass. 01773

Filed Jul. 27, 1981, Ser. No. 286,891

Int. Cl.³ G05F *1/46*; H02M *3/00*

U.S. Cl. 323—272 **5 Claims**



1. A circuit for controlling the transfer of energy from an input means to a single output, comprising in combination:

a first pulse generator for transferring electrical energy from the input means to the output;

a second pulse generator for transferring electrical energy from the input means to the output;

first input signal means connected to said first pulse generator to produce a first input pulse to said first pulse generator;

second input signal means connected to said second pulse generator to provide a second input pulse to said second pulse generator;

said first and second input signal means sequentially energizing said first and second pulse generators to sequentially transfer electrical energy from the input means to the output;

reference signal means for providing a reference signal;

comparator means for comparing the output of said first and second pulse generators to the reference signal from said reference signal means; and

gate means connected to said first and second input signal means for changing the next input pulse to one of said first and second pulse generators in accordance with the difference between said reference signal and the previous output of the other of said first and second pulse generators.

4,417,198

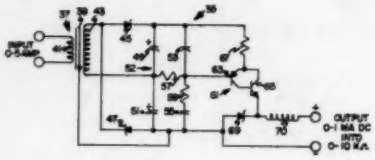
AVERAGE RESPONDING RMS INDICATING TYPE TRANSDUCER

Glenn A. Mayfield, West Lafayette, Ind., assignor to Duncan Electric Company, Inc., Lafayette, Ind.

Filed Aug. 31, 1981, Ser. No. 297,520

Int. Cl.³ G05F *3/08*

U.S. Cl. 323—315 **23 Claims**



1. A transducer of the average responding RMS indicating type, said transducer comprising:

transformer means having a primary winding for receiving an AC input signal and a secondary winding;

inductively compensated voltage divider means connected with said secondary winding of said transformer means;

filter means connected with said inductively compensated voltage divider means; and

output amplifier means connected with said active filter means and providing an output signal accurately indicative of the magnitude of the AC input signal received at said transformer means.

4,417,199

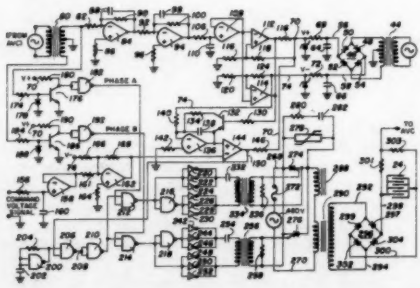
ZERO CROSSOVER TRIGGERING CIRCUIT FOR THYRISTOR

Thaddeus M. Jones, Mishawaka, Ind., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 13, 1982, Ser. No. 377,744

Int. Cl.³ G05B *24/02*

U.S. Cl. 323—319 **17 Claims**



1. A circuit for triggering a thyristor relative to a zero crossover of a power signal, comprising:

a low pass filter connected to receive said power signal and pass said power signal therethrough, said filter providing a predetermined phase shift and producing a filtered power signal,

means connected to receive said filtered power signal to generate a pulse at the zero crossover of said filtered power signal,

a waveform generator connected to receive said pulse for producing a sweeping voltage signal upon receipt of said pulse,

a comparator circuit connected to receive a command signal and said sweeping voltage signal to generate a gate signal

upon detecting a comparison of said command signal and said sweeping voltage signal, and

means responsive to said gate signal for triggering said thyristor.

4,417,200

CURRENT CONTROL

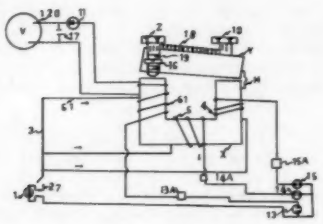
Morton Weintraub; Elliot Waxman, and Bernard Gendelman, all of Brooklyn, N.Y., assignors to Herman Rosman, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 798,261, May 18, 1977, Pat. No. 4,217,541. This application Mar. 26, 1980, Ser. No. 134,184

The portion of the term of this patent subsequent to Aug. 12, 1997, has been disclaimed.

Int. Cl.³ G05F *7/00*

U.S. Cl. 323—347 **71 Claims**



1. An apparatus for providing accurate control of an electrical condition for at least one output device, comprising,

a. at least one reactor means having a magnetic core with at least one air gap,

b. first wiring means for connection to at least one electrical output device,

c. at least one moveable bar for precisely adjusting the opening and closing of said air gap,

d. means for controlling the size of said gap by coarse i.e. unit tuning and fine or decimal tuning operations whereby control for an immediate or gradual increase or decrease of the reluctance path available through said reactor means is provided for said accurate control,

e. input terminals for connection to a power supply with a second wiring means connecting said input terminals to said reactor means.

4,417,201

CONTROL MEANS FOR CONTROLLING THE ENERGY PROVIDED TO THE INJECTOR VALVES OF AN ELECTRICALLY CONTROLLED FUEL SYSTEM

Junuthula N. Reddy, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

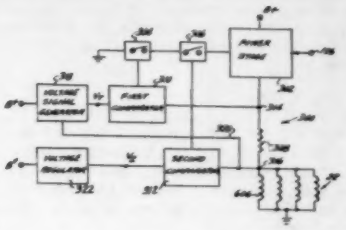
Continuation of Ser. No. 130,349, Apr. 1, 1971, abandoned. This application Jun. 14, 1973, Ser. No. 370,140

Int. Cl.³ F02M *51/00*; F02D *5/02*; H01F *7/18*

U.S. Cl. 123—490 **35 Claims**

1. In combination with a fuel control system for internal combustion engines of the type having electrically actuable injector valve means for controlling fuel flow to the engine, a source of electric energy, engine operating parameter sensors, and computing means responsive to the sensors for intermittently applying electric energy from said source to actuate said injector valve means, the improvement comprising a circuit for controlling the energization level of the injector valve means having:

voltage regulator means responsive to electric energy applied to activate the injector valve means for regulating the voltage level of said electric energy; and



current level regulating means responsive to the level of current flowing to the injector valve means for regulating said current flow.

4,417,202

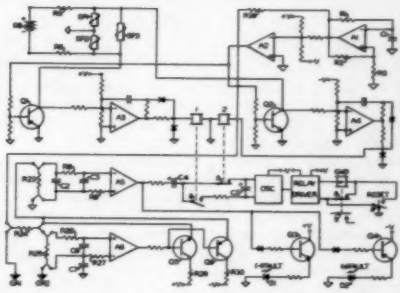
VITAL DC SOURCE GROUND FAULT DETECTOR APPARATUS

Robert D. Pascoe, Upper St. Clair Township, Allegheny County, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Jan. 30, 1981, Ser. No. 230,146

Int. Cl.³ G01R *31/02*

U.S. Cl. 324—51 **6 Claims**



1. Detector apparatus for registering ground faults on either terminal of a direct current energy source, comprising,

(a) a pair of switching means, each when active coupling a different terminal of said energy source to a common bus of said detector apparatus for producing a fault current signal having a level in accordance with the impedance of any ground fault on the opposite source terminal,

(b) a pulse generating means coupled for alternately activating said pair of switching means at a preselected rate,

(c) a current pump means controlled by said pulse generating means for alternately supplying a first and a second reference current signal, each having a preselected level and associated in time with a different one of said fault current signals alternately produced by said switching means,

(d) a comparator means coupled for alternately receiving said first and second reference current signals, each jointly with the corresponding fault current signal, and responsive to each pair of received corresponding signals for generating a first or a second output signal in accordance with a predetermined comparison level of that pair to indicate the absence or presence, respectively, of a ground fault on the corresponding terminal of said energy source,

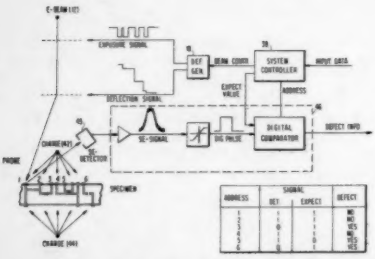
(e) a register means normally occupying a first condition and operable to a second condition for registering a ground fault indication, and

(f) a synchronizing means jointly controlled by said switching means and said pulse generating means and coupled for applying the output signals of said comparator means to hold said register means in its first condition only when said comparator output is a sequence of first signals in synchronism with the operation of said pulse generating means.

4,417,203
SYSTEM FOR CONTACTLESS ELECTRICAL PROPERTY TESTING OF MULTI-LAYER CERAMICS

Hans C. Pfeiffer, Ridgefield, Conn.; Robert A. Simpson, Wappingers Falls, N.Y., and Werner Stickel, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1981, Ser. No. 267,119
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—51 **28 Claims**



1. A method of testing electrical continuity of conductors where respective conductor ends are exposed at at least one surface of a specimen of insulating material having two surfaces, the method comprising the steps of:

pulsed irradiating a surface of said specimen with electrons to control the charge or electrostatic potential at said one surface and charge all conductors so exposed; and

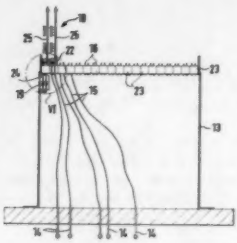
scanning a portion of at least one of said surfaces with an electron beam to selectively detect and change the potential of a conductor and thereby and all other conductors having continuity with said conductor.

4,417,204
PRINTED CIRCUIT BOARD TESTER AND ADAPTER WITH MEMORY

Rudiger Dehmel, Laatzen; Martin Maelzer, Wunstorf, and Christian Seyb, Wennigsen, all of Fed. Rep. of Germany, assignors to Luther & Maelzer GmbH, Wunstorf, Fed. Rep. of Germany

Filed Feb. 11, 1981, Ser. No. 233,326
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1980, 3013215
Int. Cl.³ G01R *15/12*
U.S. Cl. 324—73 PC **8 Claims**

1. An adapter for use with a self-programming printed circuit board tester for scanning test points on printed circuit boards, said adapter comprising adapter contact pins for contacting test points on master printed circuit boards and printed circuit boards to be tested; an adapter connecting plug having connecting plug contacts conductively connected to said contact pins, the adapter connecting plug being constructed to be connected to interrogation connections of interrogation circuits contained in the printed circuit board tester, said interrogation circuits being capable of interrogating the test points of the printed circuit boards, storing the interrogation results and making available the interrogation results to a comparator arrangement so as to permit comparison of the interrogation results obtained from interrogation of a master printed circuit board with interrogation results obtained from interrogation of a printed circuit board to be tested; and a memory preset with stored information representative of the results of a test of a master printed circuit board, said memory having read connections connected to selected contacts of the adapter connecting

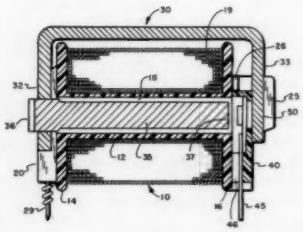


plug for connecting said memory to special interrogation connections of the interrogation circuits of the printed circuit board tester and permitting the information contained in the memory to be interrogated and compared to information previously obtained from a master printed circuit board.

4,417,205
DETECTION APPARATUS UTILIZING A HALL EFFECT DEVICE

Robert J. Sabon, Chicago, and David L. Vonder, Addison, both of Ill., assignors to GTE Automatic Electric Labs. Inc., Northlake, Ill.

Filed Oct. 14, 1980, Ser. No. 196,942
Int. Cl.³ G01R *19/15, 33/06;* H01F *3/00*
U.S. Cl. 324—133 **3 Claims**



1. A detection device connected to a source of electrical current operable to produce an output signal responsive to an electrical current of a specific value, said detection device comprising:

at least one coil encompassing a longitudinally oriented bore and connected to said source of electrical current, said coil disposed to produce a field of magnetic flux responsive to the presence of said electrical current;

a magnetic circuit for conducting said magnetic flux, said magnetic circuit including a return strap having first and second ends mounted in proximity to said coil and a manually adjustable core slidably located in said bore, said adjustable core having an end rotatably mounted to said return strap first end and an opposite end located adjacent said return strap second end forming an air gap, said adjustable core disposed to vary the density of said magnetic flux within said air gap; and

a Hall effect switch mounted within said air gap perpendicular to said field of magnetic flux, said Hall effect switch including an operating threshold and operable in response to a flux density greater than said operating threshold;

whereby said core is manually adjusted to provide a mag-

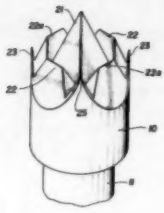
netic flux greater than said Hall effect switch threshold, producing said output signal.

4,417,206

ELECTRICAL CONTACT PROBE AND METHOD OF MANUFACTURING

Jeffrey P. Stowers, Mt. Sidney, Va., assignor to Virginia Panel Corporation, Waynesboro, Va.

Filed Mar. 9, 1981, Ser. No. 241,681
Int. Cl.³ G01R 1/06
U.S. Cl. 324—158 P 3 Claims



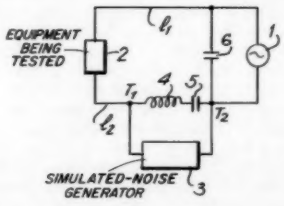
1. In an electrical contact probe, a cylindrical contact head, a center leading pyramid contact point on the head, two pairs of identical chisel contact points on the head in concentric surrounding relationship to the pyramid point and having their tips disposed in a common plane perpendicular to the longitudinal axis of the head and axially rearwardly of the tip of the center pyramid point, the chisel points lying in radial alignment with the four side faces of the pyramid point, and four additional contact points on the head disposed between the chisel points and being in radial alignment with the corners of the central pyramid point and surrounding the latter concentrically.

4,417,207

CIRCUIT FOR INJECTING SIMULATING-NOISE SIGNALS IN A POWER LINE

Yoshiro Sato, Tokyo, Japan, assignor to Toboku Metal Industries, Ltd., Sendai, Japan

Filed Mar. 13, 1981, Ser. No. 243,458
Int. Cl.³ H03K 3/53
U.S. Cl. 324—158 R 8 Claims



1. A circuit for injecting simulated-noise signals in an AC power line of electrical equipment under noise-simulating test, which comprises:

series resonance means having a resonance frequency equal to the frequency of the AC power supply and connected in said AC power line to be in series with said electrical equipment;

a capacitor means connected to said AC power line in parallel with the serial connection of said electrical equipment and said series resonance means; and

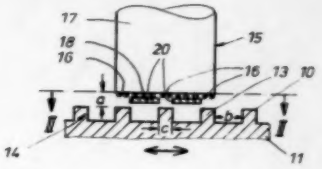
means for generating a simulating-noise signal, the output of which is connected across said series resonance means.

4,417,208

APPARATUS FOR CONTACTLESS DISTANCE AND/OR SPEED MEASUREMENT

Hansjörg Hachtel, Weissach, and Klaus Dobler, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 9, 1980, Ser. No. 214,743
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1980, 3014137
Int. Cl.³ G01P 3/46, 3/52
U.S. Cl. 324—164 20 Claims



1. An apparatus for contactless distance, or travel and/or speed measurement of bodies (11, 15) moving substantially uniformly, having zones (10-910) of electrically conductive material which are displaced in synchronism with the moving body and are disposed at a uniform distance (b) from one another in the direction of movement, and having a spatially fixed measuring transducer (15-915) disposed at a distance therefrom, which has coil means (18-918) located thereon facing said zones, and having alternating current flowing therethrough,

characterized in that

the measuring transducer (15-915) extends spatially over a multiplicity of zones (10-910) and has individual, interconnected, active measuring faces (16-916) which are spatially demarcated;

in that the distance between said measuring faces (16-916) viewed in the direction of movement of the zones (10-910) corresponds substantially to the distance (b) between adjacent zones and the width of said measuring face (16-916), viewed in the direction of movement of the zones (10-910), corresponds substantially to the width (c) of the zones (10-910);

and in that the coil means comprises at least one conductor (18-918) positioned on the zones and the conductors on the respective zones are connected together to form a single circuit.

4,417,209

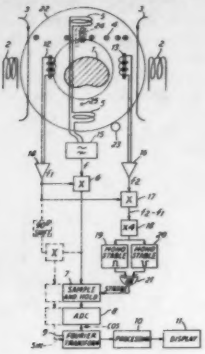
NUCLEAR MAGNETIC RESONANCE APPARATUS

Godfrey N. Hounsfield, Newark, England, assignor to Picker International Limited, Wembley, England

Filed May 19, 1981, Ser. No. 265,211
Claims priority, application United Kingdom, May 21, 1980, 8016809
Int. Cl.³ G01R 33/08
U.S. Cl. 324—309 6 Claims

1. A nuclear magnetic resonance apparatus including means for exciting resonance in nuclei in a substantially planar slice of the body of a patient, at the Larmor frequency for a magnetic field in said slice, means for imposing on said field an additional field having a gradient in a chosen direction in said slice, means for sensing a resonance signal from said slice in the presence of said gradient field, a first NMR probes for producing a signal of a frequency related to a local value of the field in the plane

of said slice, means for demodulating the resonance signal against the signal produced by said probe, and means for processing the demodulated signal to produce a distribution of a quantity in said slice.



4,417,210

METHOD OF GEOPHYSICAL PROSPECTION USING TRANSIENT CURRENTS

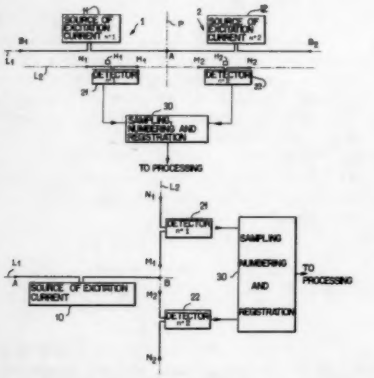
Jean-Pierre Rocroi, Massy, and Francois Gole, Meudon, both of France, assignors to Compagnie Generale de Geophysique, Massy, France

Filed Jul. 8, 1980, Ser. No. 166,893

Claims priority, application France, Jul. 9, 1979, 79 17766; Feb. 13, 1980, 80 03159

Int. Cl.³ G01V *3/02, 3/08*

U.S. Cl. 324—336 **11 Claims**



1. A method of geophysical prospecting by transient currents utilizing a plurality of prospecting stations, each of said stations comprising a transmitter dipole for transmitting an excitation impulse and a receiver dipole for receiving numerical signals representing a subsoil transient response to said excitation wherein said numerical signals are processed to obtain a figurative representation for geophysical interpretation of said subsoil responses attributable to the geographical positioning of the prospecting stations, said processing comprising:

(a) preprocessing said numerical signals to obtain a statistical composition of responses which are repeatedly registered for each of said plurality of prospecting stations;

(b) determining, for each statistically composed transient response associated with a prospecting station, a local indicator function related to variations of a gradient of said transient response as a function of time;

(c) determining, for several prospecting stations, a regional indicator function representing as a function of time a common mode of the local indicator functions associated with each of said several prospecting stations;

(d) subtracting the regional indicator from each of the local indicators to determine a residual indicator for each of the stations concerned; and

(e) producing a representation of subsoil structure features from said residual indicators determined as a function of said geographical positioning of said stations.

4,417,211

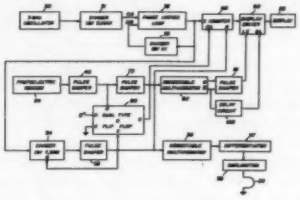
APPARATUS FOR DETERMINING THE ADVANCE OF A TIMING LIGHT

Patrick E. Ciriacks, Carpinteria, Calif., and Gary S. Gibson, Evanston, Ill., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Jul. 6, 1981, Ser. No. 280,296

Int. Cl.³ F02P *17/00*

U.S. Cl. 324—392 **16 Claims**



1. Apparatus for determining the advance of a timing light that produces flashes of illumination in response to ignition firing voltage supplied by an engine being evaluated, the amount of advance between the firing voltages and the flashes resulting therefrom being adjustable in accordance with a setting means and indicating means on the timing light, the combination comprising means for generating a first pulse train, means for establishing the frequency of the first pulse train at a first high value related to a selected engine speed, means for dividing the frequency of the first pulse train by a predetermined number in order to generate a second pulse train having a frequency of a second lower value, a firing circuit coupled to said dividing means and responsive to the second pulse train for producing firing voltages for the timing light, a photoelectric sensor responsive to flashes from the timing light to produce a sensor signal, circuit means responsive to the second pulse train and the sensor signal to generate an enable signal commencing with a pulse from said dividing means and terminating with said sensor signal, a counter having a clock input coupled to said generating means and an enable input coupled to said circuit means and being operative to count pulses in the first pulse train during the presence of the enable signal, and display means coupled to said counter and being operative to depict a number representative of the pulses counted by the counter.

4,417,212

METHOD FOR MEASURING THE AMOUNT OF OIL IN AN ESSENTIALLY NONCONDUCTIVE LIQUID

Robert A. Baum, 1932 Altura Dr., Corona Del Mar, Calif. 92625

Division of Ser. No. 20,719, Mar. 15, 1979, Pat. No. 4,313,086. This application Jul. 8, 1981, Ser. No. 281,268

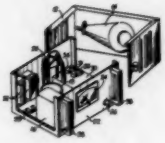
Int. Cl.³ G01N *27/02, 27/42*

U.S. Cl. 324—439 **8 Claims**

1. A method of measuring relatively small amounts of saturated hydrocarbon oil in an essentially nonconductive liquid comprising:

providing a conductivity additive which renders the hydrocarbon oil conductive but does not render the essentially nonconductive liquid conductive;

mixing the conductivity additive, the oil and the essentially nonconductive liquid to form a mixture whereby the oil of



the mixture is rendered electrically conductive and the essentially nonconductive liquid remains essentially nonconductive; and

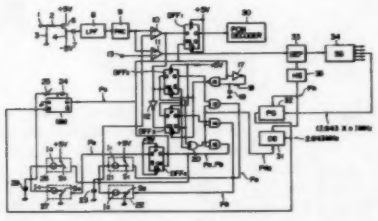
passing an electric current through the mixture after the oil is rendered conductive to obtain an indication of the amount of oil in the mixture.

4,417,213

DATA REGENERATIVE SYSTEM FOR NRZ MODE SIGNALS

Yasuo Ito, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Mar. 24, 1981, Ser. No. 247,184
Claims priority, application Japan, Mar. 27, 1980, 55-39213
Int. Cl.³ H03K *5/01, 5/08*
U.S. Cl. 328—164 **10 Claims**



1. A system for regenerating data from received Non-Return-to-Zero mode data, comprising:

a comparator having a first input receptive of said NRZ mode data and a second input receptive of a variable threshold voltage for comparison with the voltage of said NRZ mode data for generating a first or a second comparator output having first and second discrete values respectively depending on the relative value of the voltage applied to the first input to the voltage applied to the second input;

first means for generating data strobe clock pulses at a rate in conformance with the rate at which said NRZ mode data is received;

second means for generating an error signal in accordance with the difference between the time of occurrence of each of said first and second comparator outputs and the time of occurrence of said data strobe clock pulse, said error signal being applied to the second input of said comparator as said variable threshold voltage; and

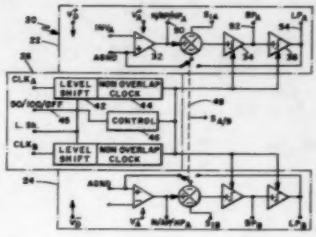
third means for generating an output pulse of the system initiating in response to the leading edge transition of said data strobe clock pulse in the presence of said first comparator output and terminating in response to the leading edge transition of said data strobe clock pulse in the presence of said second comparator output.

4,417,214

MONOLITHIC IC GENERAL PURPOSE ACTIVE FILTER

Stylianos G. Sevastopoulos, San Jose, and Sammy S. Lum, Santa Clara, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 13, 1981, Ser. No. 253,233
Int. Cl.³ H03F *1/34, 3/68*
U.S. Cl. 330—84 **3 Claims**



1. A monolithic IC general purpose active filter comprising:

a pair of filter building blocks each including a pair of serially connected summers and a pair of serially connected switched capacitor positive integrators connected to the serial output of the summers;

clock interface means for receiving and conditioning first and second external clock signals and for driving the switched capacitor positive integrators of each filter building block with a corresponding one of the first and second conditioned clock signals; and

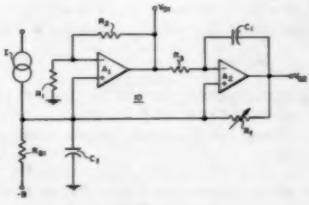
input/output means interconnected between the summers, the integrators and the clock interface means for permitting each filter building block to be configured and the center frequency thereof tuned according to at least one of the resistance ratios of externally applied resistors and the frequency of one of the first and second clock signals.

4,417,215

TUNED ANALOG NETWORK

Leonard L. Kleinberg, Greenbelt, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 10, 1981, Ser. No. 301,077
Int. Cl.³ H03F *1/34*
U.S. Cl. 330—107 **16 Claims**



1. An active network, comprising:

means for establishing an input junction with a common potential;

means coupled to said input junction for providing a first order reactance;

means coupled to said input junction for amplifying without phase shift a signal applied to said input junction;

means coupled to said input junction for shifting the phase of said applied signal and cascaded with said amplifying

means to form an equivalent first order reactance at said input junction opposite in polarity to said providing means reactance, each of said amplifying and shifting means providing an output signal;

and

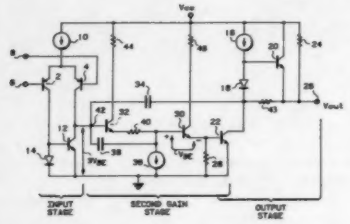
means coupled across said phase shifting means for tuning said equivalent first order reactance to create a resonant circuit at said input junction.

4,417,216

OPERATIONAL AMPLIFIER

William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 17, 1981, Ser. No. 293,753
Int. Cl.³ H03F *3/04*
U.S. Cl. 330—294 **7 Claims**



1. An operational amplifier for providing load current to an external load, comprising:

an input stage having at least one input transistor and an output;

an output stage including first and second NPN output transistors each having base, emitter, and collector terminals, said first NPN output transistor having an emitter coupled to said load for conducting load current thereto and said second NPN transistor having a collector coupled to said load for sinking load current therefrom;

first and second emitter follower transistors coupled between the output of said input transistor stage and the base of said second NPN output transistor;

a first frequency stabilizing means coupled between the output of said input transistor stage and the collector of said second NPN output transistor for stabilizing said amplifier, said first frequency stabilizing means, said second NPN output transistor and said first and second emitter follower transistors forming a loop; and

second frequency stabilizing means coupled to said first and second emitter follower transistors and to said first frequency stabilizing means for stabilizing said loop.

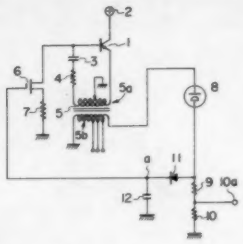
4,417,217

DISCHARGING ELEMENT ENERGIZING CIRCUIT FOR DISCHARGE-TYPE FIRE ALARM SENSOR UNIT

Kazuo Sugiyama, Mitaka, Japan, assignor to Shigeo Matsuda, Tokyo, Japan

Filed Mar. 18, 1981, Ser. No. 244,890
Claims priority, application Japan, Mar. 24, 1980, 55-037279
Int. Cl.³ G08B *17/10*
U.S. Cl. 331—66 **3 Claims**

1. A circuit for energizing a current discharge element of a discharge-type fire alarm sensor unit including a discharging element, comprising: a first circuit supplying a power voltage to said discharging element in the form of periodical output pulses making said discharging element ready to discharge a current; a second circuit supplying a feedback signal obtained from said discharging element to said first circuit so as to vary the interval of said output pulses, said first circuit comprising a third circuit generating reference pulses, a fourth circuit stepping up the voltage of said reference pulses to produce said output pulses, and a fifth circuit varying the interval of said



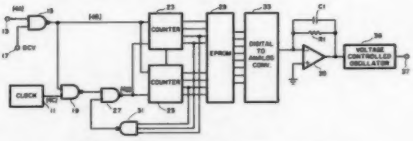
reference pulses depending on said feedback signal supplied from said second circuit.

4,417,218

LINEARIZING CIRCUIT FOR A HIGH FREQUENCY VOLTAGE CONTROLLED OSCILLATOR

Herbert Berke, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 19, 1981, Ser. No. 275,474
Int. Cl.³ H03B *23/00*
U.S. Cl. 331—178 **9 Claims**



1. A linearizing circuit comprising, in combination:

an input terminal adapted to receive a horizontal sync signal having a series of uniformly spaced horizontal sync pulses;

timing means having an input connected to said input terminal and a plurality of outputs, for producing a plurality of digital addresses, said plurality of digital addresses to be repetitive whenever said timing means receives at the input thereof one of the sync pulses of said horizontal sync signal, said timing means comprising;

a variable frequency clock having an output;

a first NAND gate having a first input connected to said input terminal, a second input, and an output;

a direct current voltage source having an output connected to the second input of said first NAND gate;

a second NAND gate having a first input connected to the output of said first NAND gate, a second input connected to the output of said variable frequency clock, and an output;

a third NAND gate having a first input connected to the output of said second NAND gate, a second input, and an output;

a first counter having a clock input connected to the output of said third NAND gate, a reset input connected to the output of said first NAND gate, an enable output, and four data outputs;

a second counter having a clock input connected to the output of said third NAND gate, a reset input connected to the output of said first NAND gate, an enable input connected to the enable output of said first counter, and four data outputs;

a fourth NAND gate having a first input connected to the second data output of said first counter, a second input connected to the first data output of said second counter, a third input connected to the second data output of said

second counter, and an output connected to the second input of said third NAND gate;

memory means having a plurality of inputs effectively connected to the outputs of said timing means and plurality of outputs, for providing, in response to each digital address produced by said timing means, a digital word;

means having a plurality of inputs effectively connected to the outputs of said memory means, and an output for converting each digital word provided by said memory means to an analog voltage; and

voltage controlled oscillator means having an input connected to the output of said converting means and an output, for providing at the output thereof a frequency signal in response to each of said analog voltages such that a linear oscillator sweep output frequency signal is formed at the output of said voltage controlled oscillator means between successive sync pulses of said horizontal sync signal.

4,417,219

PHASE DISPLACEMENT MODULATOR

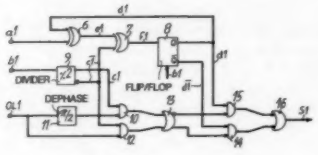
Pierre Brossard, 9 rue des Fleurs, Montigny-le-Bretonneux F-78190 Trappes, and Daniel Duponteil, 45, rue Anatole France, 92370 Chaville, both of France

Filed Oct. 24, 1980, Ser. No. 200,471

Claims priority, application France, Oct. 31, 1979, 79 27519

Int. Cl.³ H03K *7/06;* **H04L** *27/20*

U.S. Cl. 332—9 R **2 Claims**



1. A binary phase-shift modulator for modulating by phase displacement in four phase-shifted states, the modulation comprising presenting four phase-shifted states which are different from $\pi/2$, transmitting the binary symbol "1" by a phase shift of $+\pi/2$, transmitting the binary symbol "0" by a phase shift of $-\pi/2$; said modulator comprising first and second exclusive OR gate means, said first exclusive OR gate means having one input coupled to receive a modulating binary signal and having an output coupled to an input of said second exclusive OR gate means, flip-flop means having an input coupled to the output of said second exclusive OR gate means, means for coupling a first output of said flip-flop means to a second input of the first exclusive or gate means, divide-by-two means having direct and inverted outputs and having an input which is coupled to receive clock signals having a timing corresponding to the bit rate of the modulating binary signal, said divide-by-two means having an inverted output which is coupled to a second input of the second exclusive Or gate means, four AND gate means, the direct and inverted outputs of said divide-by-two means being respectively coupled to first inputs of first and second of said AND gate means, the outputs of said flip-flop means being respectively coupled to first inputs of third and fourth of said AND gate means, delay circuit means which delays by $\pi/2$, the input of said delay circuit means being coupled to receive a carrier frequency which is also applied to a second input of the second AND gate means, the output of the delay circuit means being coupled to a second input of the first AND gate means, OR gate means having a direct and an inverted output, the outputs of the first and second of the AND gate means being respectively coupled to inputs of said OR gate means, said direct and inverted outputs of said OR gate means being respectively coupled to a second input of the third and fourth AND gate means, an output OR gate means, the outputs of the third and fourth AND gate means being respectively coupled to inputs of said output OR gate means, the output of which delivers the modulated signal.

4,417,220

ADJUSTABLE AND SELECTIVE ELECTRICAL FILTERS AND METHODS OF TUNING THEM

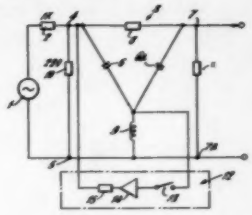
Brian T. Holyman, and Charlton R. Baty, both of London, England, assignors to Decca Limited, London, England

Filed Feb. 6, 1981, Ser. No. 232,180

Claims priority, application United Kingdom, Feb. 11, 1980, 8004490

Int. Cl.³ H03H *7/07, 7/09, 11/04;* **H03B** *5/26*

U.S. Cl. 333—174 **8 Claims**



1. An electrical filter which has a normal operational mode in which it provides narrow-band rejection of signals centered on an adjustable frequency and a test mode in which it provides amplification of signals at said frequency, the electrical filter comprising:

(a) a filter network having a narrow band rejection characteristic centered on a particular frequency and including adjustable means for altering said frequency;

(b) an ancilliary network including an amplifier; and

(c) means for completing a circuit which includes said ancilliary network and at least part of said filter network, said means for completing permitting said electrical filter to function in said normal operational mode and in said test mode.

4,417,221

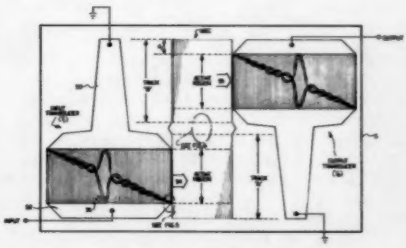
SURFACE ACOUSTIC WAVE DEVICE HAVING IMPROVED MULTI-STRIP COUPLER

Bill J. Hunsinger, Mahomet, Ill., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 2, 1982, Ser. No. 364,924

Int. Cl.³ H03H *9/42, 9/64, 9/145*

U.S. Cl. 333—194 **25 Claims**



1. A surface acoustic wave device including a substrate upon which acoustic waves can be transmitted and received, means for transmitting an acoustic wave along a first track on said surface, a multi-strip coupler for coupling the acoustic wave from said first track to a second track, said acoustic wave in

said second track having an amplitude profile transversely across said second track which exhibits a peak near at least one longitudinally extending boundary of said second track, and receiving means disposed in said second track for receiving said acoustic wave in said second track, said receiving means being responsive to essentially only those acoustic waves which pass through a sensitive region of said receiving means, said region having a first dimension transverse to said second track, where said first dimension is shorter than the width of the acoustic wave beam provided in said second track by said multi-strip coupler and where said receiving means is transversely positioned in said track so that said sensitive region is transversely spaced from said peak in said acoustic wave amplitude profile, whereby said receiving means is substantially nonresponsive to said at least one peak in the amplitude profile of said acoustic wave.

4,417,222

CIRCUIT BREAKER

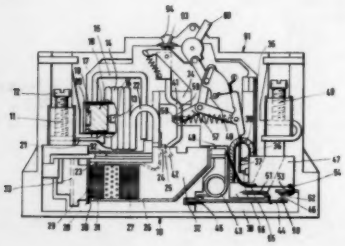
Herrmann Schmitt, Edingen-Neckarhausen; Rudolf Sellner, Eppelheim, and Klaus Greefe, Wilhelmsfeld, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Co. Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Jun. 10, 1981, Ser. No. 272,202

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1980, 3021867

Int. Cl.³ H01H *75/00, 77/00, 73/48*

U.S. Cl. 335—6 **33 Claims**



1. Automatic switch comprising at least one main contact device having at least one stationary contact and at least one movable contact, a movably supported contact lever attached to said at least one movable contact, a switch latch connected to said main contact for opening said main contact, an overload current tripping device formed of a thermo-bimetal connected to said switch latch for causing said switch latch to open said main contact upon the occurrence of an overload current, a short-circuit current tripping device connected to said switch latch for causing said switch latch to open said main contact upon the occurrence of a short-circuit current, and an additional armature system having a magnet coil, a magnet core, a magnet armature and a striker pin, said striker pin being operable for directly striking said at least one movable contact lever and for lifting said at least one movable contact from said at least one stationary contact for a given limited time in the event of short-circuit currents.

4,417,223

MULTIPOLE ELECTRIC CIRCUIT BREAKER WITH IMPROVED CURRENT LIMITING DEVICE

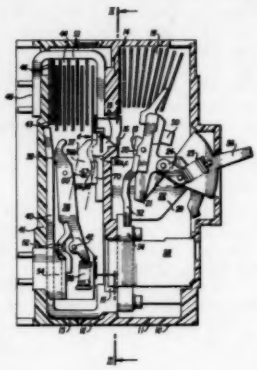
Jean Bancalari, Grenoble, France, assignor to Merlin Gerin, Grenoble, France

Filed Feb. 5, 1982, Ser. No. 346,139

Claims priority, application France, Feb. 11, 1981, 81 02800

Int. Cl.³ H01H *77/10*

U.S. Cl. 335—195 **4 Claims**



1. A multipole current limiting circuit breaker with an automatic tripping unit, each pole comprising:

a plurality of movable parallel contact arms,

electrodynamic auto-repulsive means for imparting a substantially equal opening force to each of said contact arms under the effect of a sudden increase in current whereby each of the contact arms are repulsed simultaneously,

spring means to urge said arms in the closed position,

a lost motion mechanical linkage connecting a first of said contact arms with a second of said contact arms,

abutment means cooperating only with the second contact arm for preventing the movement of the second contact arm beyond a predetermined position, said first contact arm being free to continue the opening movement beyond said abutment means by said lost motion linkage so that the inertia of the first contact arm compensates for the impact of the second arm on the abutment means and prevents immediate reclosure of the contact arms until such time as the tripping device is actuated.

4,417,224

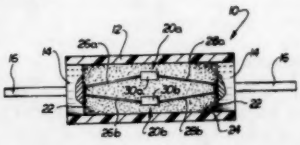
TIME DELAY FUSE

Michael E. Ross, Schaumburg, Ill., assignor to Federal Pacific Electric Co., Newark, N.J.

Filed Dec. 16, 1981, Ser. No. 331,248

Int. Cl.³ H01H *85/04*

U.S. Cl. 337—164 **11 Claims**



1. A fuse for providing short circuit and time delay overcurrent protection comprising: an insulating cartridge having a tubular shape with first and second ends, a pair of connector blocks each being sealingly attached at said first and second ends of said cartridge, two or more fusible links electrically

connected between said pair of connector blocks, said fuse links including first and second portions constructed of relatively high melting point electrically conductive material, said first and second portions being spaced apart with one end of each connected to one of said connector blocks, a third portion constructed of a relatively low melting point electrically conductive material, said third portion joining said first and second portions at the other ends of each, and a quantity of arc extinguishing material within said cartridge and surrounding said fusible link.

4,417,225

FLAT FUSE AND PROCESS FOR PRODUCTION THEREOF

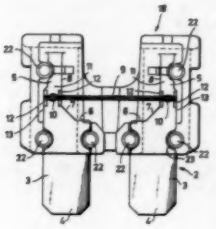
Wulf Müller, and Manfred Kaiser, both of Wuppertal, Fed. Rep. of Germany, assignors to Grote & Hartmann GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Apr. 8, 1982, Ser. No. 366,766

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115435

Int. Cl.³ H01H *85/02*

U.S. Cl. 337—198 **13 Claims**



1. A flat fuse comprising two plug blades adjacently spaced from one another in a plane, said plug blades being stamped sheet metal parts, plug zones of said plug blades extending rearwardly in a one piece construction into adjacently spaced current-conducting straps, a fuse fusion element being arranged between said straps and being secured to said straps, said current-conducting straps and said fusion element being surrounded and enclosed by a plastic casing, said fusion element including a copper wire provided with a silver sheathing, said current-conducting straps and said plug blades being fabricated from brass, at least said current-conducting straps being superficially tinned, and said fusion element being welded in each case to a flat side of said current-conducting straps.

4,417,226

ELECTRICAL FUSE

Norbert Asdollahi, and Christian Gutzmer, both of Witten, Fed. Rep. of Germany, assignors to Wickmann-Werke GmbH, Witten-Annen, Fed. Rep. of Germany

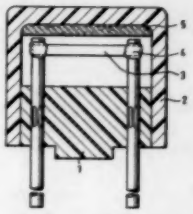
Filed Dec. 16, 1981, Ser. No. 331,172

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118943

Int. Cl.³ H01H *85/38*

U.S. Cl. 337—273 **17 Claims**

1. An electrical fuse comprising: a housing comprised of a plastic base, and a plastic cap connected to said base to define therewith the housing; two conductors extending through said base into the interior of said housing and being bridged across inside said housing by a fusible metal conductor; and a disc having a size which is slightly larger than the internal cross section of said cap and being inserted with a force fit into the interior of said cap to form a lining which at least partially lines the interior of said housing, the disc being composed of a ceramic-based insulating material effective to promote and effect the condensation thereon of metal vapor created by vaporization of the metal of the fusible metal conductor upon blowing of the fuse during an excessive overload thereby preventing explosive separation of said cap and base which



could otherwise occur due to excessive pressure build up within the interior of said housing upon blowing of the fuse.

4,417,227

VOLTAGE-DEPENDENT RESISTOR AND METHOD OF PRODUCING SUCH A RESISTOR

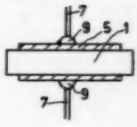
Detlev Hennings; Axel Schnell, and Herbert Schreinemacher, all of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 13, 1981, Ser. No. 263,321

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3019969

Int. Cl.³ H01C *7/10*

U.S. Cl. 338—21 **8 Claims**



1. A voltage-dependent resistor comprising a ceramic sintered body formed of a polycrystalline alkaline earth metal titanate doped with a small quantity of a metal oxide to produce an N-type conductivity and electrodes provided on opposing parallel surfaces of said sintered body, characterized in that said sintered body comprises a minor quantity of a lead germanate phase defined by the general formula $(PbO)_x$-$:(GeO_2)_y$ in the molar ratio x:y=5:1 to 1:5.

4,417,228

GAS COMPONENT DETECTOR

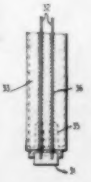
Akio Takami; Tsutomu Saito; Toshifumi Sekiya, and Kazutoshi Tanaka, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed May 6, 1982, Ser. No. 375,602

Claims priority, application Japan, May 8, 1981, 56-67178[U]

Int. Cl.³ H01L *7/00*

U.S. Cl. 338—34 **6 Claims**



1. In a gas component detector having: a gas component detecting element made of sintered metal oxide with a varying

electrical resistance according to the components of a gas to be detected; a pair of electrodes for transmitting the electrical resistance of said gas component detecting element; and a ceramic tube having through-holes into which said pair of electrodes are inserted, the improvement comprising a method of making said ceramic tube with a cylindrical ceramic heater comprising the steps of; forming on a green ceramic sheet a print pattern with metal paste for forming a heat generator; winding and bonding said sheet to the outer wall of said ceramic tube before sintering; and co-fired to integrate said heater with said ceramic tube.

4,417,229

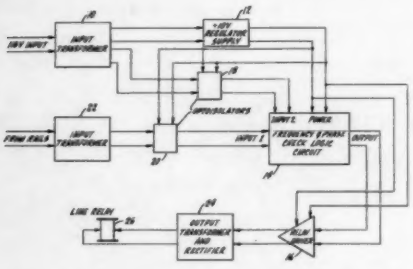
MEANS FOR USE ON A RAILROAD TO DISTINGUISH BETWEEN TRACTION CURRENT AND SIGNAL CURRENT

H. James Wilson, La Grange, Ky., assignor to Safetran Systems Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 197,281, Oct. 15, 1980. This application May 6, 1982, Ser. No. 375,393

Int. Cl.³ B61L *21/00*; G08C *19/28*

U.S. Cl. 340—47 **10 Claims**



1. Means for distinguishing between non-signal current and signal current for use on a railroad including a first input means providing an input signal of the same frequency and phase as track signal current, a second input means connected to the track to provide a track signal, means for comparing the phase and frequency of said input signal and track signal, and means responsive to said comparison means for providing a relay driving signal when the input signal and the track signal have the same phase and frequency.

4,417,230

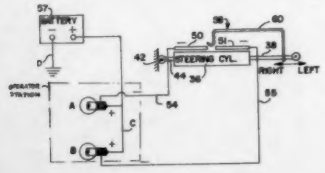
GUIDE WHEEL ANGLE INDICATOR

Robert M. Fachini, Naperville, Ill., and William D. Lester, Memphis, Tenn., assignors to International Harvester Co., Chicago, Ill.

Filed Apr. 6, 1981, Ser. No. 251,553

Int. Cl.³ B60Q *1/00*

U.S. Cl. 340—52 R **12 Claims**



1. An indicator system informing a vehicle operator as to an angular position of a vehicle guide wheel assembly relative to a vehicle rectilinear line of travel and comprising:

a hydraulic steering cylinder pivotally connected with an associated vehicle chassis,

said hydraulic cylinder having a piston rod pivotally connected with said guide wheel assembly,

first and second contact plates mounted on and electrically insulated from said hydraulic cylinder,

said first contact plate disposed at one end of said hydraulic cylinder and said second plate at another at a predetermined interval therebetween,

wheel right and left direction light indicators displayed at an associated operator's station and energized by a vehicle mounted energy source,

said right and left direction light indicators being independently and electrically connected respectively with said first and second contact plates,

adjustable spring arm means rigidly attached to said piston rod and reciprocably movable therewith for contacting one of said contact plates,

whereby when the guide wheel assembly is positioned off the vehicle rectilinear travel direction at a predetermined angle said spring arm means will contact one of said plates thereby grounding a respective electrical circuit and the direction light indicators associated therewith which will be lit and inform the vehicle operator about the direction in which the vehicle is steered.

4,417,231

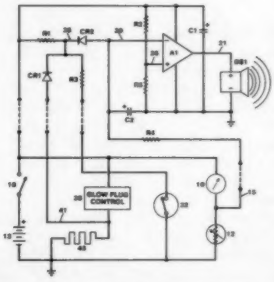
ENGINE OVER-TEMPERATURE AND OIL PRESSURE LOSS AUDIBLE WARNING DEVICE

Richard E. Watt, 6384 Rockhurst Dr., San Diego, Calif. 92120

Filed Apr. 10, 1981, Ser. No. 253,031

Int. Cl.³ G08B *19/00*; B60Q *5/00*

U.S. Cl. 340—52 F **6 Claims**



1. An audible warning device for use with internal combustion engines having a temperature indicating means, a temperature sensor and battery power from an ignition switch, the warning device monitoring engine temperature and oil pressure and producing an audible warning if an over-temperature or oil pressure loss condition develops, the improvement comprising:

electronic representation of a predetermined reference temperature and a predetermined reference oil pressure;

an electronic oil pressure sensing means connected to the engine's oil pressure system;

an electronic comparator responsive to the engine's temperature indicating and sensing system and said oil pressure sensing means, which compares a representation of the engine temperature, generated by the engine's temperature sensor, and a representation of oil pressure from said oil pressure sensing means, against said predetermined references and provides an output indication signal when the engine temperature becomes greater in magnitude or the oil pressure becomes less in magnitude than said predetermined references;

an audible signal transducer connected to the output of said

electronic comparator, which produces an audio output at the presence of the output indication signal;

first electronic circuitry means interposed between said electronic comparator's temperature sensor input and the engine's temperature indicating and sensing system, producing a momentary output indication signal from said electronic comparator when the engine's ignition switch is switched on, resulting in a momentary audio output from said audible signal transducer as a first self-test; and

second electronic circuitry means interposed between said electronic comparator's oil pressure sensor input and the said oil pressure sensing means, producing a momentary output indication signal from said electronic comparator when engine startup occurs, prior to the buildup of engine oil pressure, resulting in a momentary audio output from said audible signal transducer as a second self-test.

4,417,232

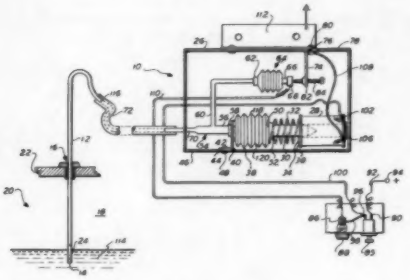
LIQUID VOLUME INDICATOR

Farouk F. Tewfik, 33C Forest Dr., Garnerville, N.Y. 10923

Filed Apr. 16, 1979, Ser. No. 29,978

Int. Cl.³ B60Q *1/00*; G01F *23/00*; G08B *21/00*

U.S. Cl. 340—59 **5 Claims**



1. A device for indicating the presence or absence of a liquid in a vessel, the vessel being of the type used as a crankcase for an automobile or the like, said device comprising:

(a) a device housing;

(b) a tube for sampling liquid;

(c) a first hollow chamber housing coupled to said sampling tube; said first chamber housing comprises flexible chamber walls such that the volume of said first chamber may be selectively expanded or contracted; upon expansion of said first chamber housing volume a suction is created in said sampling tube so as to enable said tube to sample the liquid;

(d) a second chamber housing coupled to said sampling tube; said second chamber housing comprises flexible walls such that second chamber walls are capable of moving in response to the absence of the liquid in said tube upon said creation of said suction;

(e) means for expanding or contracting said first chamber volume; and

(f) means responsive to said movement of said second chamber housing to indicate the absence of sampled liquid in said tube; said responsive means comprises an electrical circuit; said electrical circuit comprises a pair of engageable electrical contacts and indicating means; said indicating means are coupled to said contacts for indicating whether said electrical contacts are engaged; one of said contacts being secured to said second housing chamber, said other contact being secured to said device housing such that said movement of said second housing chamber thereby causes said contacts to engage or disengage.

4,417,233

FULLY PARALLEL THRESHOLD TYPE ANALOG-TO-DIGITAL CONVERTER

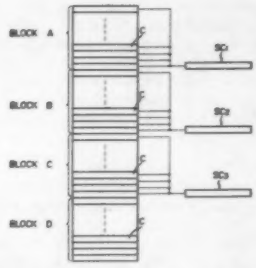
Michihiro Inoue, Ikoma; Toyoki Takemoto, Yawata, and Haruyasu Yamada, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1980, Ser. No. 123,646

Claims priority, application Japan, Feb. 28, 1979, 54-24005; Sep. 19, 1979, 54-121158; Sep. 19, 1979, 54-121159; Oct. 18, 1979, 54-134968

Int. Cl.³ H03K *13/03*

U.S. Cl. 340—347 AD **4 Claims**



1. A fully parallel threshold type A/D converter for an input signal having a predetermined voltage range, comprising:

A plurality of comparators each of which has a fixed reference voltage corresponding to a quantizing level and which are disposed in parallel with each other, said comparators being divided into a plurality of blocks; and

a sub comparator operatively associated with each of said comparator blocks, whereby the input signal is first compared by the sub-comparators and then compared by the comparators in one comparator block selected and supplied with power in response to the output from the associated sub-comparator,

said reference voltages encompassing the full range of said input signal and remaining unchanged during the operation of both the sub-comparators and the comparators of said converter.

4,417,234

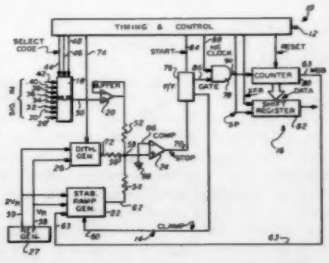
MULTIPLEXED ANALOG TO DIGITAL CONVERTER HAVING A FEEDBACK STABILIZED RAMP

Joseph V. McKenna, Franklin Lakes, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Dec. 3, 1981, Ser. No. 326,874

Int. Cl.³ H03K *13/20*

U.S. Cl. 340—347 AD **3 Claims**



1. An analog-to-digital converter for an inertial navigation system comprising:

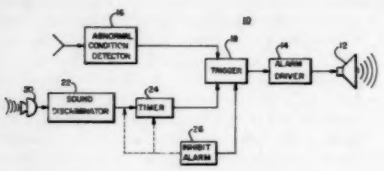
an inertial navigation platform having a gyroscope and an accelerometer supplying a plurality of analog signals,
a multiplexer connected to the gyroscope and the accelerometer for receiving one analog input signal from the plurality of analog signals,
a timing unit coupled to the multiplexer for selecting the one analog input signal,
a comparator having an input connected to the multiplexer,
a feedback stabilized ramp generator having an output connected to the comparator input and having a feedback input,
a gated counter connected to and controlled by the comparator for supplying a digital output which is representative of the platform analog signal,
a feedback line connected between the gated counter and the feedback input of the stabilized ramp generator,
a dither generator connected to the comparator input,
a buffer having an input connected to the multiplexer and an output connected to the comparator, and
a reference generator connected to the stabilized ramp generator and connected to the dither generator.

4,417,235

AUDIBLE ALARM NETWORK

Donald J. Del Grande, 1832 Frankford Ave., Philadelphia, Pa. 19125

Filed Mar. 24, 1981, Ser. No. 247,003
Int. Cl.³ G08B *1/00*; G10K *11/00*
U.S. Cl. 340—531 **9 Claims**



1. An alarm unit, for directly alerting persons to an abnormal condition, comprising:
means for detecting an abnormal condition;
means for automatically detecting presence of a predetermined audible alarm signal, the signal being a warning sound directly perceptible as such by the persons;
means for generating the same said predetermined perceptible audible alarm signal; and,
triggering means for activating the predetermined audible alarm signal generating means in response to said means for detecting an abnormal condition and also in response to said means for detecting an audible alarm signal.

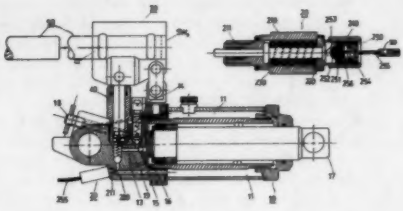
4,417,236

OVERLOAD DETECTING DEVICE

Michael Hung, 6th Fl., No. 683, Min-Sheng, East Rd., Taipei, Taiwan

Filed Nov. 6, 1981, Ser. No. 319,382
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—626 **6 Claims**

1. An overload detecting and alarm device for a hydraulic jack having a coupling member receiving a removable pumping lever comprising,
an electronic alarm coupled with the hydraulic jack including power switching means installed in the lever coupling member and actuated by the pumping lever for applying power to the electronic alarm when the pumping lever is inserted in the coupling member;
a pressure sensitive switch operatively connected to the electronic alarm, the switch being inserted in the body of the hydraulic jack and communicating with a ram cylinder through a duct, said switch having a housing, a pressure actuated first electrical contact member extending through one side of said housing into the duct and a second electrical contact member provided at the opposite side in said housing, said first electrical contact capable of



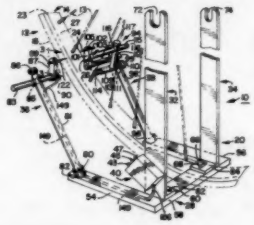
moving against a bias to contact said second electrical contact member when a fluid pressure in the second cylinder and duct acts thereon, thereby causing said electronic alarm system to produce an alarm signal.

4,417,237

APPARATUS AND METHOD FOR DETECTING AND INDICATING MISALIGNMENTS OF VEHICLE WIRE SPOKE WHEELS

John K. Korth, 904 S. Lancaster St., Mount Prospect, Ill. 60056

Filed Jun. 4, 1981, Ser. No. 270,582
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—686 **10 Claims**



1. An apparatus for detecting and indicating misalignments of the rim of a wire spoke wheel relative to its axle as the wheel rotates about its axis, comprising:
right sensing means (including electrical switch means mounted adjacent to one side of the wheel) for producing a right electrical signal by establishing a right electrical circuit path in response to relative movement of the wheel and said right sensing means toward one another through a right predetermined distance to a certain position and for alternatively terminating said right electrical signal by said right electrical circuit path in response to the wheel and said right sensing means moving backwardly past said certain position relative to one another;
left sensing means (including electrical switch means mounted adjacent to the other side of the wheel) for producing a left electrical signal by establishing a left electrical circuit path in response to relative movement of the wheel and said left sensing means toward one another through a left predetermined distance to a certain position and for alternatively terminating said left electrical signal by opening said left electrical circuit path in response to the wheel and said left sensing means moving backwardly past said certain position relative to one another;
electrical circuit means, including conductor means forming a portion of the electrical circuit paths, responsive to said sensors for conveying said pair of right and left electrical signal remotely therefrom; and
a pair of first and second indicating devices connected to

said electrical circuit means and closely spaced together remotely to at least one of said sensors for providing lateral misalignment information in response to either the respective right electrical signal or the left electrical signals or both of them simultaneously.

4,417,238

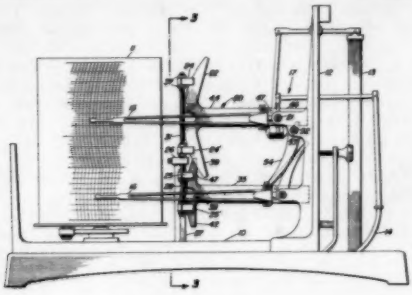
ALARM MODIFICATION FOR METEOROLOGICAL INSTRUMENT

Beryl A. Lanterman, Timonium, Md., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 219,082, Dec. 22, 1980, abandoned. This application Apr. 16, 1982, Ser. No. 368,796

Int. Cl.³ G08B 21/00

U.S. Cl. 340—688 **5 Claims**



1. A modification kit for adding an electrical alarm feature to an instrument originally designed to provide only visual indication of a quantity being measured, said instrument including a sensor producing a motion in response to changes in the measured quantity, an output shaft, a linkage coupling motion of said sensor to said shaft and an indicating arm coupled to said shaft, said arm showing the value of the measured quantity, said modification kit comprising;

an elongated shutter arm one end of which defines an area the major portion of which is opaque and a minor portion of which is transparent;

means for securing the other end of said shutter arm to said instrument output shaft without disturbing said shaft in its mountings, said shutter arm extending generally parallel with said instrument indicating arm, said securing means including a hub member having a slot therein permitting said hub member to be fitted over said output shaft, means on said hub member for securing said output shaft in said slot, and means securing said hub member to said other end of said shutter arm;

a photo source-sensor including a light source and a photo sensor mounted in a unitary body with said light source separated from and facing said photo sensor; and

means including a shaft extending parallel to the plane of motion of said shutter arm and means for securing said sourcesensor to said shaft at a selectable position along said shaft for adjustably supporting said photo source-sensor adjacent said shutter arm to permit motion of said shutter arm within the space separating said light source from said photo sensor, whereby said major opaque portion of said shutter prevents light transmission from said source to said photo sensor during movement of said output shaft for which no alarm signal is to be generated and further movement of said shaft to the alarm signal set point carries said minor transparent area of said shutter arm into the space separating said light source from said photo sensor permitting light transmission therebetween and causing said photo sensor to generate an electrical output signal.

4,417,239

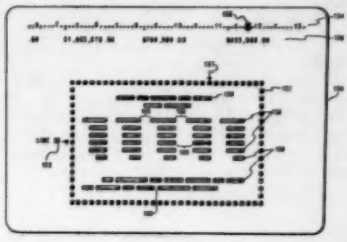
INTERACTIVE COMBINATION DISPLAY

Kent R. Demke, and Joanne L. Mumola, both of Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 24, 1980, Ser. No. 219,668

Int. Cl.³ G09G 1/00

U.S. Cl. 340—709 **4 Claims**



1. In a processor driven word processing system including a memory, a display, means for performing operations including text entry and editing on at least one line of displayed data, and means for horizontally segmenting text lines wider than the display, the improvement comprising:

means for displaying simultaneously, with at least a portion of at least one cursored line of active text, a less than full size representation of a complete, full page of text;

means for indicating simultaneously the corresponding location of the active line of text in said less than full size page representation; and

wherein said means for displaying further includes means for displaying symbols indicating text character relative positions.

4,417,240

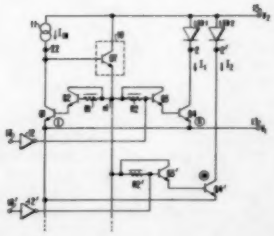
PLURAL OUTPUT SWITCHED CURRENT AMPLIFIER AS FOR DRIVING LIGHT EMITTING DIODES

Adel A. A. Ahmed, Clinton Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1980, Ser. No. 153,629

Int. Cl.³ G09G 3/00

U.S. Cl. 340—782 **17 Claims**



1. A switched current amplifier comprising:

a master transistor having respective emitter, base and collector electrodes;

a plurality of slave transistors, having respective emitter, base and collector electrodes;

an input terminal to which the collector electrode of said master transistor is connected;

a plurality of output terminals, each respective output terminal being connected to a respective one of the collector electrodes of said plurality of slave transistors;

a common terminal to which the emitter electrodes of said

master and plurality of slave transistors are each connected;

direct-coupled amplifier means for direct coupling the collector electrode of said master transistor to a circuit node;

a plurality of additional transistors having respective emitter electrodes, each except that of the last being connected to a respective one of all the base electrodes of said slave transistors and that of the last being connected to the base electrode of said master transistor, and having respective base and collector electrodes;

means for making forward biasing current available from said circuit node to the base electrodes of said additional transistors, including

a plurality of resistors having respective first ends connected to said circuit node and having respective second ends each being connected to a respective one of all the base electrodes of said plurality of additional transistors, and

means connected to the base electrodes of each of said additional transistors, except the last, for selectively diverting its forward biasing current from it.

4,417,241

MAGNETICALLY OPERATED MATRIX DISPLAY PANEL AND ELEMENTS THEREFOR

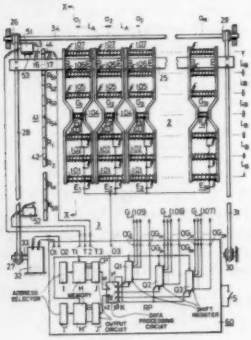
Masayuki Wakatake, Tokyo, Japan, assignor to Yugen-Kaisha Wakatake Giken, Tokyo, Japan

Filed Jun. 26, 1981, Ser. No. 277,828

Claims priority, application Japan, Jul. 1, 1980, 55-89332

Int. Cl.³ G06K *15/18*

U.S. Cl. 340—815.05 **6 Claims**



1. A display panel comprising:

a display surface structure;

a display switching unit; and

a drive unit;

in which, letting an arrangement of N vertical lines of arrangement spaced a predetermined distance from adjacent ones of them in a horizontal direction be represented by $a_1, a_2, \ldots a_N$, respectively, the display surface structure has M display elements $D_{i1}, D_{i2}, \ldots D_{iM}$ disposed on the vertical line a_i (i=1, 2, . . . N) at predetermined intervals in a vertical direction;

in which the display element D_{ij} (j=1, 2, . . . M) is formed with a block member with uniform cross section having an outer periphery forming a plurality of display surfaces of different colors to form a plurality of edges parallel to and around an axis extending in the horizontal direction, a magnetic piece of a first type disposed near each of the edges except one of them and a magnetic piece of a second type disposed near the remaining edge, the display element D_{ij} being supported by supporting means in a manner to be rotatable about the axis and to permit a selected one of the display surfaces to lie in a vertical plane;

in which the display switching unit has a first erasing head E_i, a second erasing head F_i and a writing head G_i disposed to be movable along each vertical line a_i in the vertical direction, the first erasing head E_i having magnets numbering one less than the edges of the block member, the second erasing head F_i having a magnet, the writing head G_i having electromagnets of the same number as the magnets of the first erasing head; and

in which the drive unit has means for simultaneously moving down the first erasing heads E_1 to E_N, the second erasing heads F_1 to F_N and the writing heads G_1 to G_N and means for driving the electromagnets of the writing heads G_1 to G_N in synchronism with the movement of the writing heads G_1 to G_N.

4,417,242

METHOD FOR CONNECTING OR DISCONNECTING SELECTED STATIONS IN A RING COMMUNICATION SYSTEM, AND RING COMMUNICATION SYSTEM INCLUDING SELECTIVELY CONNECTABLE STATIONS

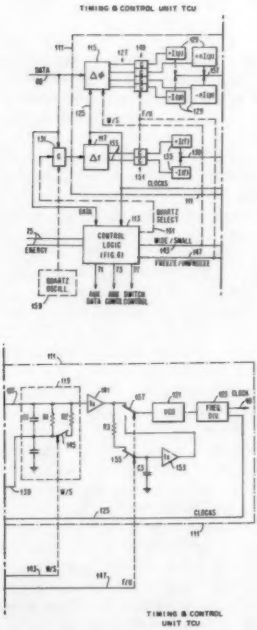
Urs Bapst, Kilchberg; Heinz Keller, Ruschlikon, both of Switzerland; Heinrich Meyr, Aachen, Fed. Rep. of Germany, and Hans R. Muller, Langnau, Switzerland, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,746

Claims priority, application European Pat. Off., Mar. 12, 1981, 81 101 825.8

Int. Cl.³ H04Q *9/00;* **H04L** *7/08;* **H04J** *3/08*

U.S. Cl. 340—825.05 **12 Claims**



1. Method for connecting or disconnecting selected stations (**T1** . . . **T6**, FIG. **1**) in a communication system including a closed loop transmission ring to which a variable number of stations may be connected, connecting circuitry (**A1** . . . **A6**, FIG. **1**; FIG. **3**) comprising phase-locked loop circuitry (FIGS. **5A**, **5B**) for synchronization being provided with each such station, characterized in that

the transmission ring is temporarily interrupted when a selected station is connected or disconnected,

the resulting interruption of signal energy is detected in the connecting circuitry of the next station down the ring, and causes freezing the respective phase-locked loop circuitry at its current frequency and phase,

reappearance of signal energy is detected in said connecting circuitry of said next station and causes defreezing and reactivation of the respective phase-locked loop circuitry.

4,417,243

Patent Not Issued For This Number

4,417,244

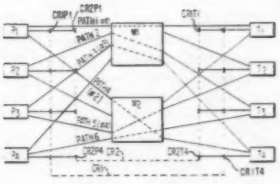
AUTOMATIC PATH REARRANGEMENT FOR BLOCKING SWITCHING MATRIX

Constantin M. Melas, Los Gatos, Calif., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 1, 1981, Ser. No. 298,398

Int. Cl.³ H04Q *9/00*

U.S. Cl. 340—825.8 **4 Claims**



1. A method of rearranging paths in a blocking switching network, said blocking switching network comprising at least primary, intermediate and tertiary stages, with at least two intermediate switching matrices in said intermediate stage, each said intermediate switching matrix with a number of inlets and outlets less than the total number of inlets of primary stage matrices or the total number of outlets of tertiary stage matrices, comprising the steps of:

(a) detecting a connection request for a path which is blocked;

(b) identifying a first intermediate matrix with an appropriate free primary link and a second intermediate matrix with an appropriate free tertiary link;

(c) naming paths, for rearrangement in said switching network associated with said first and second intermediate matrices, in sequential order beginning at a primary outlet or tertiary inlet forming part of said blocked path and proceeding from one end of one path at a primary outlet or a tertiary inlet to another path beginning at the same primary outlet or tertiary inlet at the other end of said one path until an unused primary outlet or tertiary inlet is identified;

(d) breaking a selected one of said named paths and making said blocked path;

(e) breaking another of said named paths and rearranging selected paths named prior to said another path to use an intermediate matrix other than the one previously used to free links from intermediate matrices to primary outlets or tertiary inlets;

(f) making a connection through said primary, intermediate and tertiary stages for one or another of said paths broken in steps (d) or (e);

(g) repeating said steps (e) and (f) until all broken connections are made.

4,417,245

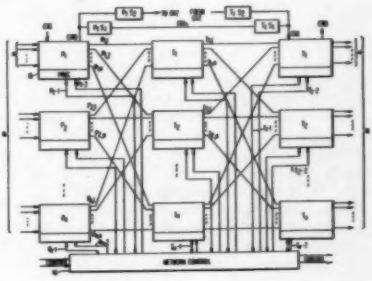
DIGITAL SPACE DIVISION EXCHANGE

Constantin M. Melas, Los Gatos, Calif., and Michael A. Patten, Cary, N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 2, 1981, Ser. No. 298,705

Int. Cl.³ H04Q *9/00, 3/00*

U.S. Cl. 340—825.8 **9 Claims**



1. A switching network comprising:

a plurality of intelligent crosspoint arrays, each with plural input and plural output conductors, for selectively connecting input and output lines in response to externally generated commands;

network control means for generating said external commands and for monitoring the status of said arrays; and

coupling means for coupling said network control means to sid intelligent arrays, said coupling means including one multi-mode conductor and one single mode conductor for each said arrays, said multi-mode conductor being operable to transmit bidirectional sequential signals representative of a command and/or a response and said single mode conductor being operable to transmit unidirectional signal for changing the mode of operation of said multimode conductor.

4,417,246

PAGING RECEIVER HAVING A SERIAL CODE PLUG

William C. Agnor, Lynchburg, and James H. Elder, Brookneal, both of Va., assignors to General Electric Company, Lynchburg, Va.

Continuation-in-part of Ser. No. 95,447, Nov. 19, 1979, abandoned. This application Nov. 5, 1980, Ser. No. 204,277

Int. Cl.³ G08B *5/22*

U.S. Cl. 340—825.44 **75 Claims**

1. An improved paging radio receiver for producing a page output responsive to a predetermined preamble signal followed

by a predetermined sequence of N paging signals, where N is any integer greater than one, said receiver comprising:

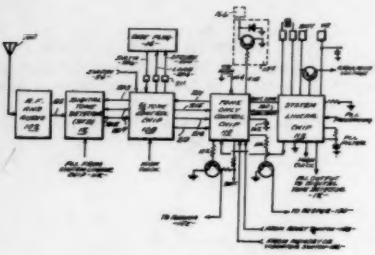
a. means for receiving a radio signal modulated by said preamble signal and paging signals;

b. means for demodulating the preamble and N paging signals from the radio signal;

c. programmable signal detection means connected to said demodulating means for detecting demodulated preamble and paging signals;

d. control means, connected to said signal detection means, for first programming said signal detection means for detecting said predetermined sequence of N paging signals, second programming said signal detection means for detecting said predetermined preamble signal, and third, in response to said predetermined preamble signal being detected by said signal detection means, programming said signal detection means for detecting said predetermined sequence of N paging signals; and

e. means, connected to said control means, for producing said page output in response to said predetermined sequence of N paging signals being detected by said signal detection means as programmed by said control means.



4,417,247

CIRCUITRY CONTROLLED BY CODED MANUAL SWITCHING FOR PRODUCING A CONTROL SIGNAL

Daryl D. Dressler, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 29, 1981, Ser. No. 316,233

Int. Cl.³ H04Q 3/02

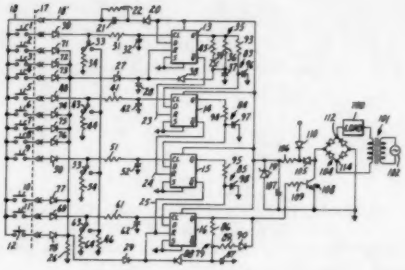
U.S. Cl. 340—825.31 **9 Claims**

1. Circuitry controlled by a series of switch actuations in accordance with a preselected switch code for providing a control signal including

a plurality of flip-flop circuits, one for each digit of the preselected switch code, each of said flip-flop circuits having at least one output and at least two input terminals, one of said input terminals of one of said flip-flop circuits arranged for connection to a d.c. source;

means connecting said plurality of flip-flop circuits in series for series operation of said plurality of flip-flop circuits, said one flip-flop circuit connected as the first flip-flop circuit of said series, said series operation requiring the flip-flop circuit preceding a given flip-flop circuit to provide a signal from said one output of said preceding flip-flop circuit to one of said input terminals of said given flip-flop circuit to condition said given flip-fllop circuit for providing a signal at said one outpot of said given flip-flop circuit in response to a signal presented to the other of said input terminals of said given flip-flop circuit, said means including a time delay circuit portion for each given flip-flop circuit having a preceding flip-flop circuit, said time delay circuit portion for a given flip-flop circuit connected to said one input of the given flip-flop circuit and to said one output of the flip-flop preceding the given flip-flop circuit;

a plurality of manually operable switches actuatable in accordance with a preselected switch code, said code having a plurality of digits which are fewer in number than said switches, said plurality of switches selectably connectable to said plurality of flip-flop circuits and when actuated providing a signal useable as a signal input to the other of said input terminals of said flip-flop circuits, said plurality of switches, when connected to said flip-flop circuits and actuated in accordance with said preselected switch code, providing for said series operation of said plurality of flip-flop circuits, said last flip-flop circuit of said series when operated providing said control signal.



4,417,248

ADAPTIVE COLLISION THREAT ASSESSOR

Bruce D. Mathews, Arnold, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 30, 1981, Ser. No. 279,497

Int. Cl.³ G01S 13/00

U.S. Cl. 343—16 M **9 Claims**

1. A monopulse radar operative to detect at least one potential threat and to track said threat through a sequence of time increments beginning with the detection thereof, wherein the improvement includes a system for assessing said detected threat adaptively in accordance with the relative bearing thereof with respect to said radar to determine the collision potential thereof with said radar, said system comprising:

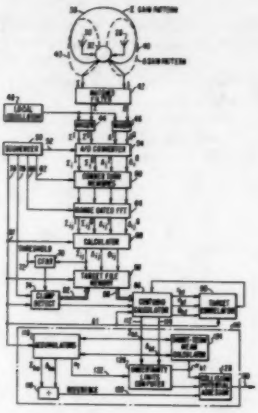
means for deriving a signal representative of said relative bearing of said detected threat for each time increment to generate a sequence of relative bearing representative signals respectively corresponding to said sequence of time increments;

means for generating a first signal for each of a selected number of time increments based on a signal weighting function of said relative bearing representative signals derived for the sequence of time increments from threat

detection to said corresponding selected time increment, inclusively;

means for generating a second signal for each of said selected number of time increments based on a signal weighting function of a predetermined number of most recently derived relative bearing representative signals with respect to said corresponding selected time increment;

means for generating a third signal for each of said selected



number of time increments based on a function representative of the fluctuations in the relative bearing representative signals generated for the sequence of time increments from threat detection to said corresponding selected time increments, inclusively; and

means for compairing, at each of said selected number of time increments, the deviation between said correspondingly generated first and second signals with said corresponding generated third signal to determine the collision potential of said detected threat with said radar.

4,417,249

PHASE WEIGHTED ADAPTIVE PROCESSOR

John W. Zscheile, Jr., Murray, Utah, assignor to Sperry Corporation, New York, N.Y.

Filed Sep. 8, 1980, Ser. No. 184,741
Int. Cl.³ H04B *7/00*
U.S. Cl. 343—379 **13 Claims**

1. An adaptive processor system of the type employed to eliminate undesired signals, comprising:

a first signal path having an undesirable reference signal thereon,

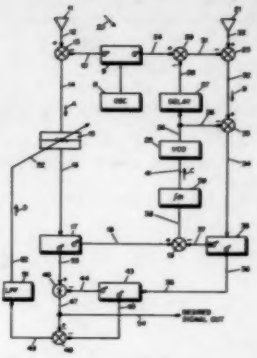
a second signal path having an attenuated and delayed replica of said undesired reference signal thereon, which is processed to track said reference signal,

a phase tracking feedback path connected in parallel with said second signal path and adapted to shift the phase of said attenuated and delayed replica of said undesired reference signal in said second path to equal the phase of said reference signal,

said phase tracking feedback path comprising therein, a voltage controlled oscillator and a delay coupled to the output of said voltage controlled oscillator,

the output of said delay being phase shifted as a function of the frequency of said voltage controlled oscillator to provide a phase shifted oscillator output signal, and

means in said second signal path for coupling said oscillator output signal and said phase shifted oscillator output signal to the attenuated and delayed replica of said reference



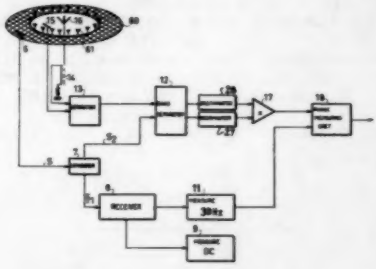
signal to provide a phase shifted attenuated and delayed replica signal in phase with said reference signal.

4,417,250

MONITORING DEVICE FOR A RADIO NAVIGATION SYSTEM OF THE DOPPLER VOR TYPE

Alain Grousseau, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 18, 1981, Ser. No. 235,516
Claims priority, application France, Feb. 26, 1980, 80 04212
Int. Cl.³ G01S *1/40*
U.S. Cl. 343—405 **5 Claims**



1. A monitor device for a radio nagivation system of the Doppler VOR type, which system comprises a central antenna radiating omnidirectionally a very high frequency carrier wave amplitude modulated by a first reference 30 Hz frequency sinusoidal signal and a circular network of antennae radiating two ±9960 Hz side-bands of the amplitude modulation of the VHF carrier wave, said side-bands being themselves frequency modulated by a second variable 30 Hz frequency sinusoidal signal whose phase varies with respect to that of the first 30 Hz signal, comprising means for monitoring the signal emitted by said Doppler VOR system, said means comprising:

a sensor placed in the vicinity of the transmitting antennae of said VOR system;

a first device for processing the signal received by said sensor, said first processing device itself comprising:

means for separating the two side-bands;

means for providing said variable 30 Hz signal from said two side-bands;

first means for measuring the modulation rate of said reference 30 Hz signal from the signal received by said sensor;

second means for measuring the continuous component of the signal received by said sensor; and

third means for measuring the phase difference between said reference 30 Hz signal from said first measuring means and said variable 30 Hz signal from said providing means.

4,417,251

INK JET HEAD

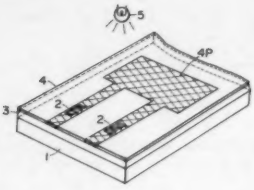
Hiroshi Sugitani, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1981, Ser. No. 238,422

Claims priority, application Japan, Mar. 6, 1980, 55-28654; Aug. 29, 1980, 55-120272

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—1.1 **23 Claims**



18. A method for manufacturing an ink jet head having at least one ink flow path through which ink droplets are produced which comprises: forming a photosensitive resin layer on a substrate provided with an ink discharging pressure generating element therein, producing cured regions in said layer according to a predetermined pattern, and removing uncured resin from said layer to produce a groove in the surface of the substrate constituting said ink flow path.

4,417,252

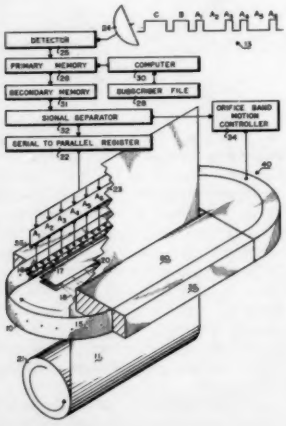
FLUID DRIVE FOR AN ORIFICE BAND INK JET PRINTER

Stephen F. Skala, 3839 S. Wenonah Ave., Berwyn, Ill. 60402

Continuation-in-part of Ser. No. 353,640, Mar. 1, 1982. This application Jun. 7, 1982, Ser. No. 385,915

Int. Cl.³ G01D *9/00, 15/18*

U.S. Cl. 346—1.1 **28 Claims**



1. A method for attaining a predetermined motion of an endless band, comprising the steps of:

constraining the endless band to a path wherein the endless band is separate from solid structures,

generating an error signal representing a difference between actual motion of the endless band and predetermined reference motion thereof,

regulating flow of a fluid which is adjacent to the endless band to exert a fluid force thereon in response to the error signal, and

exerting an auxiliary force on the endless band so that the combination of the fluid force and the auxiliary force nulls the error signal.

4,417,253

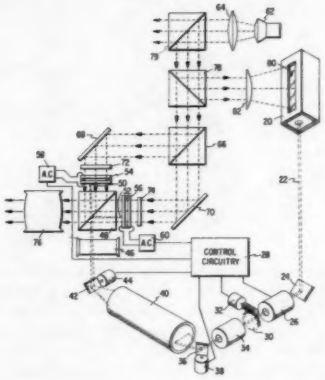
ARRANGEMENT FOR LASER PUMPING IN A COMBINED LASER RECORDING AND COLOR PROJECTION SYSTEM

Herbert G. Jacks, Tujunga, Calif., assignor to The Singer Company, Stamford, Conn.

Filed Dec. 16, 1981, Ser. No. 331,439

Int. Cl.³ G01D *9/32*; H01S *3/091*

U.S. Cl. 346—17 **6 Claims**



1. In a recording and projection system which includes a laser utilized for recording an image and a source of projection light utilized for projecting the recorded image, the improvement comprising:

means utilizing said projection light source for providing excitation energy for said laser.

4,417,254

VALIDATOR FOR ELECTROCARDIAL DATA PROCESSING SYSTEM

Donald C. Woods, Lompoc, Calif., assignor to Del Mar Avionics, Irvine, Calif.

Division of Ser. No. 88,105, Oct. 24, 1979, Pat. No. 4,339,800, which is a continuation-in-part of Ser. No. 957,527, Nov. 3, 1978. This application Apr. 26, 1982, Ser. No. 371,783

Int. Cl.³ G01D *9/26*

U.S. Cl. 346—33 R **19 Claims**

1. Apparatus for the high speed printing and plotting of alpha-numeric characters and incoming data signals respectively, comprising in combination:

a carriage, including marking means for producing marks on a medium in response to the applied data signal, said carriage movable back and forth along a path segment extending across the medium;

a servo connected to said carriage for controlling the velocity of said carriage along the path and tending to bring the velocity of said carriage into equality with an applied velocity command, and driving said carriage in a continuous uninterrupted motion from one end to the other of the path segment;

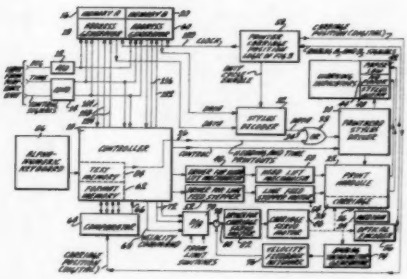
position logic means including sensing means operatively

associated with said servo, for generating a position signal indicative of the location of said carriage along the path segment and for generating clock signals in relation to the movement of said carriage to various positions along the path segment;

control means connected to said servo and applying the velocity commands to said servo;

first memory means connected to a source of incoming data signals, connected to said position logic means to receive said clock signals, connected to said control means for selectively storing the incoming data signals in response to a first store enable signal generated by said control means, and connected to said marking means to supply the stored data signals to said marking means in timed relation to the clock signals generated by said position logic means and in response to a first print enable signal generated by said control means;

second memory means connected to the source of incoming data signals, connected to said position logic means to receive said clock signals, connected to said control means for selectively storing the incoming data signals in response to a second store enable signal generated by said control means, and connected to said marking means to supply the stored data signals to said marking means in timed relation to the clock signals generated by said position logic means and in response to a second print enable signal generated by said control means;



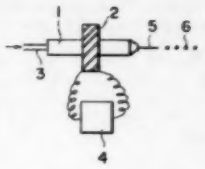
said control means connected to said first and said second memory means and receiving from them, respectively, first and second status signals indicative of the amount of storage capacity remaining unused in said first and said second memory means, connected to said position logic means and receiving said position signal from said position logic means and generating the velocity commands in response to said position signal and in response to said first and second status signals, said control means generating said first and said second store enable signals in an alternating sequence in relation to said first and said second status signals so that those portions of the incoming data signals which are not stored in said first memory means are stored in said second memory means, and generating said first and said second print enable signals in an alternating sequence timed with respect to the store enable signals such that when said first memory means is supplying the stored data signal to said marking means, said second memory means is storing the incoming data signals, and such that when said second memory means is supplying the stored data signal to said marking means, the first memory means is storing the incoming data signal.

4,417,255

INK-JET PRINTER

Isokazu Furukawa, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Aug. 19, 1981, Ser. No. 294,142
Claims priority, application Japan, Aug. 20, 1980, 55-114293
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **9 Claims**



1. An ink-jet printer for forming characters on a recording medium by ink droplets in a dot-matrix format comprising:

an ink nozzle;

ink supply means for supplying ink to said nozzle;

vibrating means mounted on said nozzle for imparting vibration to the ink contained in said nozzle, said vibrating means having the resonant frequency of $3f_0$; and

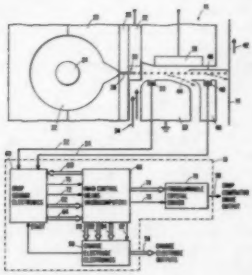
driving means for driving said vibrating means with a driving signal having frequency f_0.

4,417,256

BREAK-OFF UNIFORMITY MAINTENANCE

Gary L. Fillmore; Van C. Martin, both of Boulder, and Gregory L. Ream, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 148,472, May 9, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,280
Int. Cl.³ G01D *18/00*
U.S. Cl. 346—75 **11 Claims**



1. In a multinozzle ink jet printing system wherein streams of ink are generated from a multinozzle head and broken up into individual droplets of ink, and a trajectory characterizing means channels the droplets into a print flight path and a no-print flight path, the improvement comprising:

an exicitation means associated with the multinozzle head and operable to generate a plurality of droplet streams therefrom;

a sensing means positioned downstream from the point at which streams are broken up into droplets and operable to sense a characteristic associated with said droplet streams, said characteristic being indicative of the distance from said sensing means to the droplet break-off point in each stream, and to output a first set of signals representative of said characteristic; and

a controller means operable to process the signals to determine the spread in break-off point distances from stream to stream and responsive to the spread to generate a drive signal for altering the magnitude of the excitation produced by the excitation means so that the spread in the distances at which droplets are detaching from the individual streams is maintained within a minimum range.

4,417,257

PRINTING HEAD FOR THERMAL PRINTER

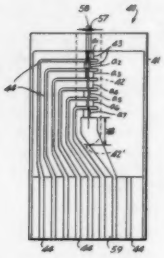
Yoshihiro Mitsui, Shiojiri, Japan, assignor to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Filed Dec. 18, 1981, Ser. No. 332,125

Claims priority, application Japan, Dec. 22, 1980, 55-184380[U]; Dec. 24, 1980, 55-185806[U]

Int. Cl.³ H05B *1/00*

U.S. Cl. 346—76 PH **22 Claims**



18. A printing head for a thermal printer, said thermal printer including means for laterally translating said printing head across a thermosensitive recording medium for thermally printing a row of characters across said thermosensitive medium comprising a substrate, first and second glaze layers formed on a portion of said substrate, said first and second glaze layers being spaced from one another in the lateral direction, a plurality of heating elements disposed on each said first and second glaze layers, and electrode means disposed on said substrate and extending proximate said heating elements on said first and second glaze layers for selectively activating said heating elements to form dots on said thermosensitive medium which define said characters.

4,417,258

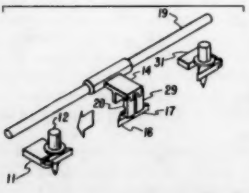
BI-DIRECTIONAL PEN CHANGER

David C. Tribolet, San Diego, and Richard M. Kemplin, Poway, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 13, 1982, Ser. No. 339,212

Int. Cl.³ G01D *15/00*

U.S. Cl. 346—139 R **8 Claims**



1. A pen holding and changing device for use in a plotter comprising:

pen stable means mounted to said plotter for holding pens at two fixed locations, one of said two fixed locations at each of two opposite sides of said plotter, when said pens are not in use for plotting;

pen holder/changer means mounted to said plotter for holding one of said pens during plotting, said pen holder/changer means having a first direction of motion defined by the line between said two fixed locations, said pen holder/changer means also for snatching said pen from said pen stable means from either of said fixed locations by moving only along said first direction of motion.

4,417,259

METHOD OF PREVENTING INK CLOGGING IN INK DROPLET PROJECTING DEVICE, AN INK DROPLET PROJECTING DEVICE, AND AN INK JET PRINTER

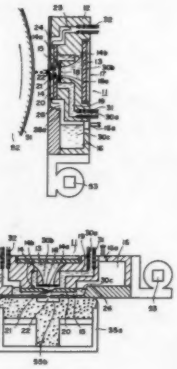
Junji Maeda, Kyoto, Japan, assignor to Sanyo Denki Kabushiki Kaisha, Moriguchi, Japan

Filed Jan. 25, 1982, Ser. No. 342,646

Claims priority, application Japan, Feb. 4, 1981, 56-16180; Mar. 11, 1981, 56-35623; Jul. 6, 1981, 56-105960; Jul. 17, 1981, 56-112727; Sep. 19, 1981, 56-139314[U]

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **29 Claims**



1. A method of preventing ink clogging in the ink droplet projecting device, in which an air cell is provided in front of the 1st orifice through which ink droplets are projected and the 2nd orifice facing said 1st orifice is provided in said air cell so that printing is performed by projection of ink droplets through said 2nd orifice, characterized in that liquid is introduced into said air cell for covering the 1st orifice during non-printing operation.

4,417,260

IMAGE SCANNING SYSTEM

Yasuhiro Kawai; Yoshihiko Okamoto; Takaaki Yamamoto, and Hisatoyo Kato, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 12, 1982, Ser. No. 397,443

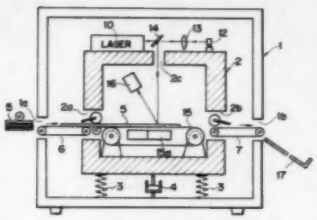
Claims priority, application Japan, Jul. 23, 1981, 56-115664

Int. Cl.³ G01D *15/14*

U.S. Cl. 346—160 **8 Claims**

1. An image scanning system for two-dimensionally scanning a light beam across a recording medium comprising a feeding and discharging means for feeding the recording medium to a scanning position and discharging it therefrom, a sub-scanning means for feeding the recording medium in the sub-scanning direction at the scanning position, and a light beam scanning means for scanning the light beam in the main scanning direction at the scanning position, the light beam scanning means including a light source for emitting the light

beam and a light deflecting means for deflecting the light beam to sweep the recording medium on the sub-scanning means in the main scanning direction,



characterized in that said light source, light deflecting means and the sub-scanning means are mounted on a single inner frame which is mounted by a vibration insulator on an outer frame on which said feeding and discharging means is mounted.

4,417,261

TRANSFERRED ELECTRON DEVICES

Kenneth W. Gray; James E. Pattison, and How D. Rees, all of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation-in-part of Ser. No. 685,575, May 12, 1976, abandoned. This application Sep. 6, 1977, Ser. No. 830,950
Claims priority, application United Kingdom, May 13, 1975, 20218/75
Int. Cl.³ H01L 47/02, 47/00
U.S. Cl. 357—3 13 Claims

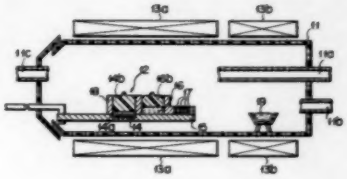
1. A transferred electron effect oscillator device comprising a cathode structure and an anode structure with a layer of n-type supercritically doped active material therebetween, said active material exhibiting the transferred electron effect by which electrons are scattered from states of high mobility to states of low mobility by the application of an electric field greater than a certain threshold level and thereby leading to a region of negative differential mobility in the functional dependence of mean electron velocity on electric field, wherein the cathode structure comprises a first zone next to the active layer, and a second zone providing a high electrical resistance to the first zone; said first zone comprising a layer of n+ semiconductor material of the same material as the active layer but having a doping concentration greater than that of the active material and a thickness less than 2 μm; said second zone comprising, next to the first zone, a layer of semiconductor material of the same material as the active layer but differently doped and of a thickness greater than 0.03 μm so that no appreciable amount of electrons can tunnel therethrough, and an outer metal layer.

4,417,262

GREEN LIGHT EMITTING DEVICE

Masami Iwamoto, Tokyo; Makoto Tashiro, Yokohama; Tatsuro Beppu, Tokyo, and Akinobu Kasami, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 169,612, Jul. 17, 1980, which is a continuation of Ser. No. 950,049, Oct. 10, 1978. This application Apr. 6, 1981, Ser. No. 250,934
Claims priority, application Japan, Oct. 7, 1977, 52-120037; Oct. 7, 1977, 52-120039
The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.
Int. Cl.³ H01L 33/00
U.S. Cl. 357—17 15 Claims



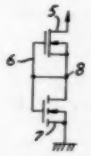
1. In a green light emitting device comprising an n-type GaP substrate, an n-type GaP layer formed on the substrate and a p-type GaP layer formed on the n-type GaP layer, the improvement wherein said n-type GaP layer includes a first layer formed on the GaP substrate and a second layer directly formed on the first layer, said second layer being closer to the p-type GaP layer, the net donor concentration in said first layer being higher than the net donor concentration in said second layer, the donor concentration in said first layer being abruptly decreased to that of said second layer, and said second layer containing nitrogen at a higher concentration than in said first layer.

4,417,263

SEMICONDUCTOR DEVICE

Yoshiaki Matsuura, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jan. 16, 1981, Ser. No. 225,468
Claims priority, application Japan, Feb. 1, 1980, 55-011021
Int. Cl.³ H01L 29/78
U.S. Cl. 357—23 2 Claims



1. A semiconductor device, comprising:

a depletion type MOS field effect first transistor comprised of a substrate having formed thereon a gate, a source and a drain of said first transistor, wherein said first transistor gate is connected to said first transistor source and said first transistor source is connected to said first transistor substrate;

a MOS field effect second transistor having the same conductivity type as said first transistor and comprised of a substrate having formed thereon a gate, a source and a drain of said second transistor, wherein said second transistor gate is connected to said second transistor drain and

said transistor source is connected to said second transistor substrate; and

said first and said second transistors are connected with their respective source-drain channels in series, and a respective one of the source and drain of said second transistor defining a power terminal of the device.

4,417,264

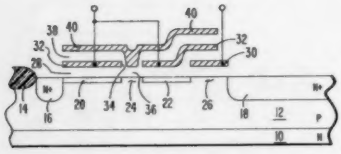
ELECTRICALLY ALTERABLE, NONVOLATILE FLOATING GATE MEMORY DEVICE

Rodney L. Angle, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,565

Int. Cl.³ H01L *29/78, 27/02, 29/04;* **G11C** *11/40*

U.S. Cl. 357—23 **6 Claims**



1. In a floating gate memory device of the type including a body of semiconductor material of a first conductivity type having first and second doped regions of a second conductivity type formed in the semiconductor body at the surface thereof, the first and second doped regions spaced one from the other to define a channel region therebetween in the semiconductor body for supporting current flow between the doped regions, a first conductive layer insulated from the body of the semiconductor material, a second conductive layer positioned over both the channel region and the first conductive layer and insulated therefrom, the first conductive layer having a first aperture therein into which the second conductive layer extends, the improvement comprising:

a first portion of the channel region, adjacent the first doped region having a pair of depletion type regions embedded in the semiconductor body at the surface thereof and spaced one from the other to define a first channel portion therebetween;

a second aperture in the first layer of polysilicon, aligned with the first channel portion, into which a portion of the second conductive layer extends;

a second channel portion adjacent the second doped region and occupying the remainder of the channel region; and

a third conductive layer positioned over and insulated from the second channel portion.

4,417,265

LATERAL PNP POWER TRANSISTOR

Judd R. Murkland, Santa Clara, Calif., and James S. Congdon, Maynard, Mass., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 26, 1981, Ser. No. 247,700

Int. Cl.³ H01L *27/02*

U.S. Cl. 357—51 **9 Claims**

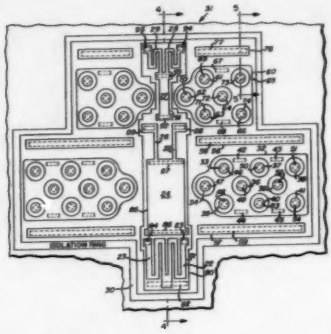
1. A lateral power transistor suitable for construction into a semiconductor substrate having a planar surface oxide, said transistor comprising:

a plurality of parallel connecting individual transistor elements arrayed in groups of elements located within the surface of a semiconductor having one conductivity type, each element having an emitter of the opposite semiconductor conductivity type confronted by a spaced apart collector of said opposite conductivity type, wherein the space between said emitter and collector constitutes a base region;

said groups being located on opposite sides of and disposed along a center region;

means adjacent to each of said groups for making distributed contact to said transistor base regions therein,

crossunder resistance means located within said center region for making resistance connections to said distributed contact



means whereby the base currents in said transistor elements are ballasted and equalized; and

metalization located on top of said semiconductor oxide for interconnecting said transistor elements into a unitary device in which said metalization can be run directly over said center region thereby permitting said groups to be parallel connected without interfering with said base connections.

4,417,266

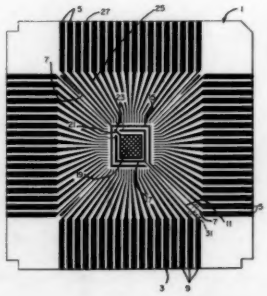
POWER AND GROUND PLANE STRUCTURE FOR CHIP CARRIER

Dimitry G. Grabbe, Lisbon Falls, Me., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 14, 1981, Ser. No. 293,052

Int. Cl.³ H01L *39/02, 23/48, 29/44*

U.S. Cl. 357—80 **2 Claims**



1. A system for carrying semiconductor chips and the like comprising:

(a) an electrically insulating ceramic substrate,

(b) a copper electrical conductor pattern having a copper oxide surface adjacent said substrate and fused to said substrate, said conductor pattern extending to plural locations at the edges of said substrate,

(c) an electrically and thermally conductive pad at the center of said substrate for receiving a semiconductor chip thereon,

(d) a first electrically conductive pattern on said substrate surrounding said pad and connected to a lead of said conductor pattern, and

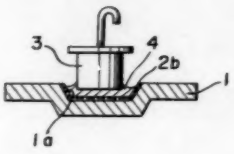
(e) a second electrically conductive pattern on said substrate surrounding said pad within said first conductive pattern and connected to a lead of said conductor pattern.

4,417,267

COOLING MEANS FOR SEMICONDUCTOR DEVICE

Hifumi Wada, and Mitsuaki Nanba, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1981, Ser. No. 263,275
Claims priority, application Japan, Jun. 18, 1980, 55-86233[U]
Int. Cl.³ H01L 23/02, 23/48, 29/46, 29/62
U.S. Cl. 357—81 2 Claims



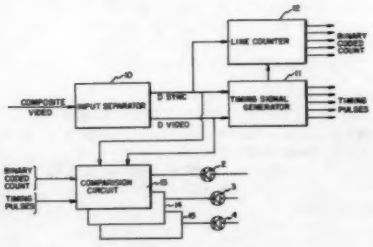
1. A cooling means for a semiconductor device which comprises a heat radiating plate made of aluminum or aluminum alloy, having a fitted part for a semiconductor device; an alloy layer formed only at said fitting part of the heat radiating plate to allow easy soldering and a solder layer for bonding said semiconductor device to said alloy layer, wherein said alloy layer is formed by heating a metal halide dispersed on the fitting part.

4,417,268

TELEVISION SIGNAL MONITORING DEVICE

Richard W. LaSota, 1272 Rolling Meadow Rd., Pittsburgh, Pa. 15241

Filed Jan. 25, 1982, Ser. No. 342,666
Int. Cl.³ H04N 9/62
U.S. Cl. 358—10 30 Claims



1. An apparatus for monitoring parameters of television signals comprising:

input circuit means for receiving the composite video signal,

separating circuit means for clamping the tips of the sync pulses at one reference level and repeatedly sampling the blanking level to establish a second reference level,

means for generating a first pulse suitable for input to digital logic circuits corresponding to the horizontal and vertical sync pulse,

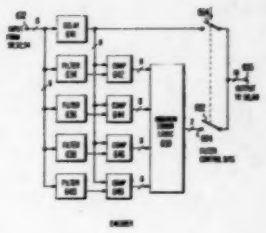
and means for generating a second pulse suitable for input to digital logic circuits corresponding to the video signal exceeding a preselected threshold measured from the said second reference level.

4,417,269

ADAPTIVE RECONSTRUCTION OF THE COLOR CHANNELS OF A COLOR TV SIGNAL

Robert A. Dischert, Burlington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,447
Int. Cl.³ H04N 9/32
U.S. Cl. 358—12 12 Claims



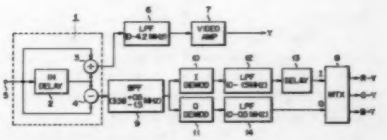
1. A method for removing aliases from at least a first component signal of a video signal using one alias free component of said video signal, said method comprising determining from said alias free component the direction of least resolution, and averaging said alias containing component in said direction.

4,417,270

WIDE BAND CHROMINANCE DEMODULATOR WITH COLOR NOISE REDUCTION FUNCTION

Nobuya Nagao, and Takashi Inoue, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 7, 1982, Ser. No. 337,753
Claims priority, application Japan, Jan. 28, 1981, 56-12075
Int. Cl.³ H04N 5/37
U.S. Cl. 358—23 7 Claims



1. A wide band chrominance demodulator with color noise reduction function comprising:

(a) circuit means responsive to a TV radio wave with a given field strength, for providing a composite color video signal contained in said TV radio wave, and generating a control signal corresponding to the field strength of said TV radio wave;

(b) separator means coupled to said circuit means, for separating I and Q signals from said composite color video signal;

(c) processor means coupled to said circuit means and separator means and responsive to said control signal and I signal, for providing a controlled I signal, wherein the frequency response characteristic between said I signal and said controlled I signal is changed according to said control signal; and

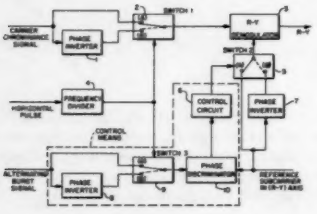
(d) means coupled to said separator means and processor means and responsive to said Q signal and controlled I signal, for generating color difference signals.

4,417,271

DEMODULATOR CIRCUIT FOR COLOR TELEVISION SIGNALS OF PAL SYSTEM

Yoshimori Nakase, Sakai, and Takayuki Sagishima, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 27, 1981, Ser. No. 286,756
Claims priority, application Japan, Jul. 30, 1980, 55-105464
Int. Cl.³ H04N 9/50
U.S. Cl. 358—24 5 Claims



1. A color demodulating apparatus for PAL type color television signals, said apparatus comprising:

a frequency divider which is supplied with a horizontal pulse train and which outputs a switching pulse train having a frequency which is equal to one half of a horizontal scanning frequency;

a first switching means which is supplied with a carrier chrominance signal in the R−Y axis;

a first phase inverter which is supplied with said carrier chrominance signal in the R−Y axis, said first switching means being connected to one input of an R−Y demodulator used to demodulate R−Y color signals extracted from television signals, and said first switching means having a switch control terminal supplied with an output of said frequency divider, wherein said first switching means alternatively feeds said carrier chrominance signal in the R−Y axis and an inverted carrier chrominance signal with its polarity inverted from that of said carrier chrominance signal through said first phase inverter to said R−Y demodulator for each horizontal scanning period;

a second switching means which is supplied with a reference subcarrier in the R−Y axis;

a second phase inverter which is supplied with said reference subcarrier in the R−Y axis, wherein said second switching means alternatively feeds said reference subcarrier in the R−Y axis and the reference subcarrier with the polarity inverted from that of said reference subcarrier in the R−Y axis through said second phase inverter to another input of said R−Y demodulator; and

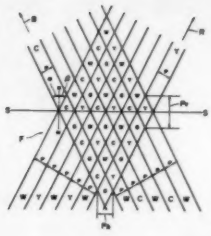
a control means connected to said second switching means to control second switching means, wherein the polarity of the reference subcarrier fed to one input of said R−Y demodulator is identical to the polarity of the R−Y signal fed to said other input of said R−Y demodulator.

4,417,272

COLOR TELEVISION CAMERA HAVING A COLOR SEPARATION CROSSING STRIPED FILTER

Yuzuru Inoue, Machida; Takashi Shinozaki, Yokohama; Yoshichi Otake, Kamakura, and Shinsuke Ono, Yokosuka, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Oct. 8, 1981, Ser. No. 309,805
Claims priority, application Japan, Oct. 8, 1980, 55-140912; Oct. 9, 1980, 55-141312; Oct. 12, 1980, 55-142269
Int. Cl.³ H04N 9/07
U.S. Cl. 358—44 8 Claims



1. A color television camera for generating an electrical output signal indicative of an image of a subject, comprising:

(a) a lens system;

(b) a pickup element responsive to the light applied through said lens system for generating said electrical signal;

(c) a color separation crossing striped filter positioned in the light path of said color television camera, said color separation crossing striped filter having two sets of repetitive arrangements of parallel color stripes respectively extending in different directions, each of said two sets having repetitive color stripes of a plurality of given colors; and

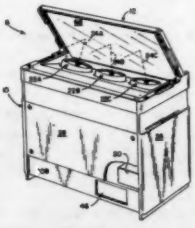
(d) an optical filter positioned in said light path for defocusing said image on the photoelectric conversion surface of said pickup element, said optical filter being arranged such that a blur occurs in a direction substantially normal to the extending direction of an image of one color stripe and the width of said blur is a function of Ph, wherein Ph is the length of an image of one color stripe in the direction of the scanning line in said image of one of said repetitive arrangements of said color separation crossing striped filter.

4,417,273

VIDEO PROJECTION SYSTEM

Henry E. Kloss, Cambridge, Mass., assignor to Kloss Video Corporation, Cambridge, Mass.

Filed Jan. 4, 1982, Ser. No. 336,727
Int. Cl.³ H04N 9/31
U.S. Cl. 358—60 10 Claims



1. In a video image projection system including means for

processing a video signal representative of a video image so as to provide a processed video signal, and at least one optical projection device responsive to said processed video signal for forming and projecting an image-forming beam of light along an optical axis so as to provide said video image on a viewing surface at a focal plane spaced a predetermined distance from said system along said axis, said system further comprising:

portable cabinet means including (1) a cabinet for supporting said projection device so as to project said image-forming beam in a substantially upward direction through an upper, open portion of said cabinet, and (2) a top including a specularly light-reflective surface disposed to face said projection device, said top being so dimensioned and movable between a first position wherein said top serves as a closure for said upper portion of said cabinet, and a second position wherein said light reflective surface is disposed to fold said optical axis so as to reflect said beam in a substantially horizontal direction; and

optical positioning means operable independently of said optical projection device and supported by said cabinet means for positioning said system so that said focal plane and said viewing surface may be brought into substantial congruence with one another.

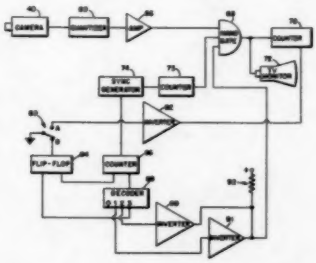
8. A system according to claim 1, wherein said projection device includes three projection tubes responsive to said processed video signal, each of said tubes projecting along a corresponding separate optical axis, an image forming beam of light including said video image in a correspondingly different color, said tubes being supported by said cabinet so that each said tube projects said video image in said focal plane in registered relationship with the video images of the other tubes.

4,417,274

ELECTRONIC MEASURING METHOD AND APPARATUS

James W. Henry, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,806
Int. Cl.³ H04N 7/18
U.S. Cl. 358—107 **10 Claims**



1. Method of making an area measurement of a bright portion of an object which comprises the steps of

(a) generating a video signal having a predetermined line scan frequency of at least a single frame duration which includes the bright portion,

(b) applying the video signal representing only the bright portion to a switching device, one input of which is supplied with a switching signal having a frequency of at least 10 times the line scan frequency of the video signal to divide the bright portion into a series of pulses, the duration of the pulse series being controlled by edges of the bright portion, and

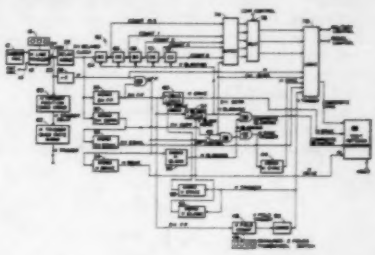
(c) electrically applying an output signal from said switching device to a digital counter, whereby the area of said bright portion is measured in terms of number of pulses counted.

4,417,275

SELECTABLE RATE SYNC GENERATOR SYSTEM

John H. Harshbarger, Xenia, and William M. Shores, Dayton, both of Ohio, assignors to Visual Information Institute, Inc., Xenia, Ohio

Filed Oct. 10, 1980, Ser. No. 196,154
Int. Cl.³ H04N 5/06
U.S. Cl. 358—139 **12 Claims**



5. For use with a television test pattern generator, a selectable rate sync generator system comprising: master oscillator means having a predetermined frequency; means for selecting the desired total horizontal line time; means coupled to said oscillator means and to said first selecting means for generating a train of clock pulses having twice the repetition rate (2H) of the line time selected; means for generating H rate blanking and drive pulses of predetermined duration in response to said clock pulses; means for selecting the desired number of horizontal scanning lines in two fields; means coupled to said clock pulse generating means and to said last-named selecting means for generating vertical trigger pulses having the repetition rate (V) of the number of lines selected; means for generating V rate blanking and drive pulses of predetermined duration in response to said V trigger pulses; means for summing said H and V rate blanking pulses to provide a composite blanking signal; means for generating H rate sync pulses of predetermined duration in response to said clock pulses and delayed therefrom by a predetermined interval; means for generating V rate sync pulses having a predetermined duration in response to said V rate blanking pulses; means for summing said H and V rate sync pulses to provide a composite sync signal; said clock pulse generating means including means for generating a train of pulses having one-half the repetition rate (H) of said clock pulses; means for delaying said 2H rate pulses by a predetermined time; means for generating horizontal front porch pulses at said 2H rate in response to the trailing edge of said delayed 2H pulses; said V blanking and drive pulse generating means including means for respectively initiating said V rate blanking and drive pulses in response to said V trigger pulses and for terminating the same in response to said 2H front porch pulses.

4,417,276

VIDEO TO DIGITAL CONVERTER

Matthew C. Bennett, Ann Arbor, and Donald R. Strange, Howell, both of Mich., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 16, 1981, Ser. No. 254,771
Int. Cl.³ H04N 5/14
U.S. Cl. 358—160 **16 Claims**
MICROFICHE APPENDIX INCLUDED
(5 Microfiche, 312 Pages)

1. A system for digitizing a video signal of a plurality of horizontal scanning lines and storing the digitized signal in a computer memory comprising:

(a) means for converting an analog signal to digital form to establish digital values corresponding to relative luminance of the video signal;

(b) first counter means for establishing X-coordinates of a

predetermined number of picture elements corresponding to a horizontal line;

(c) means for assigning said luminance values to said corresponding X-coordinates;

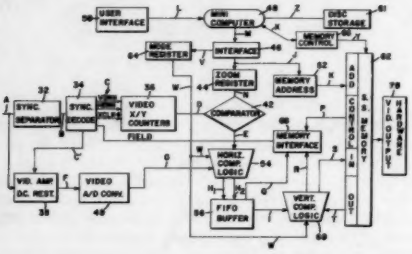
(d) means for resetting said first counter when said predetermined number is reached indicating the end of a scanning line;

(e) second counter means incremented by said resetting means for establishing Y-coordinates corresponding to horizontal lines of said video signal, whereby a main matrix of picture elements having X and Y coordinates and a luminosity value is defined;

(f) means for resetting said second counter when a predetermined number of horizontal lines is reached;

(g) means for generating coordinates of a sub-matrix which falls within said matrix;

(h) comparator means for generating an active signal for



each picture element falling within said predefined sub-matrix region;

(i) horizontal compression means activated by said active signal for comparing the luminance of successive groups of predetermined numbers of horizontally adjacent picture elements within said sub-matrix region and generating successive single horizontally compressed picture elements to be substituted for said groups;

(j) buffer means for serially receiving said horizontally compressed picture elements in real time and outputting said elements at a slower rate;

(k) vertical compression means for comparing groups of horizontally compressed picture elements which are vertically adjacent and for generating successive image elements to be substituted therefor;

(l) means for addressing and storing said image elements in a computer memory for later revival and restoration to a video image.

4,417,277

TELEVISION RECEIVERS

Kenichi Tonomura; Shigeru Kadokawa, both of Takasaki, and Michinao Ohsawa, Matsumoto, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 297,566
Claims priority, application Japan, Aug. 29, 1980, 55-118332
Int. Cl.³ H04N 5/52
U.S. Cl. 358—177 **8 Claims**

1. A television receiver comprising:

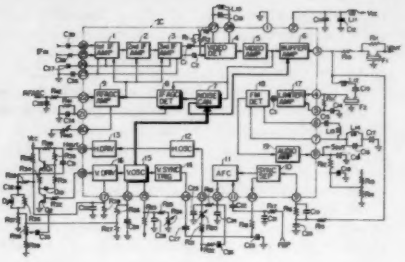
(1) a video intermediate frequency amplifier for amplifying a video intermediate frequency signal;

(2) a video detector which is connected to receive the output signal of said video intermediate frequency amplifier at its input and provide a composite video signal from its output;

(3) noise canceller means for cancelling a noise component in said composite video signal;

(4) an AGC detector which is connected to receive an output signal of said noise canceller at its input and provide from its output an AGC voltage for controlling the gain of said video intermediate frequency amplifier;

(5) a vertical oscillator which is substantially controlled by a vertical synchronizing pulse in said composite video signal for producing an output pulse signal to control vertical deflection; and



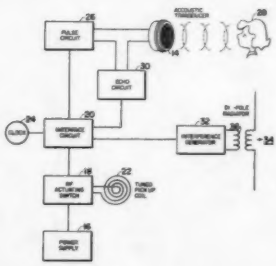
(6) means controlled by a pulse provided from said vertical oscillator for inhibiting the noise cancelling operation of said noise canceller means associated with the operation of said AGC detector during the vertical flyback time of vertical deflection.

4,417,278

TELEVISION RECEIVER SCRAMBLING SYSTEM

Robert H. Hensleigh, 8516 Harwood, Fort Worth, Tex. 76118; Charles M. Lacy, 5509 Dartmouth, Fort Worth, Tex. 76114, and Hardy H. Walton, Jr., 8572 Harwood Rd. #299, Fort Worth, Tex. 76118

Filed Jun. 19, 1981, Ser. No. 275,500
Int. Cl.³ H04N 5/44
U.S. Cl. 358—188 **10 Claims**



1. A proximity detection system mounted in combination with a TV receiver and adapted to disrupt the program of the receiver at times when an object of at least the dimensions of a child is positioned within a designated distance and a designated viewing area in front of the television picture, said detection system comprising:

(a) means for supplying electrical power to energize said detection system;

(b) pulse generator means for producing discrete periodic high energy electrical pulses;

(c) combination acoustic pulse transducer means responsive to said pulse generator means for producing discrete periodic acoustic pulses into said viewing area, and for detecting and converting discrete acoustic signals reflected back from said viewing area into discrete electrical echo signals;

(d) comparator means for receiving a signal corresponding

to each of said electrical pulses and said echo signals and producing an actuating signal as a function of the time between each pulse of said electrical pulses and its corresponding echo signal; and

(e) receiver program disruption means for receiving said actuating signal and operating to produce a disruption signal of selected frequency and thereby to scramble said program during such time period as said actuating signal is within a range where said object is within a designated distance from said transducer.

4,417,279

FM TELEVISION SIGNAL RECEIVING CIRCUIT

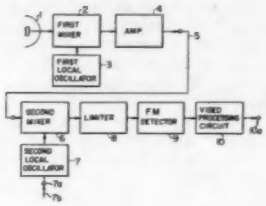
Keiro Shinkawa, Yokohama; Shigeo Matsuura, Chigasaki; Chuichi Sodeyama; Masaki Noda, both of Yokohama, and Masakazu Kondo, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 11, 1982, Ser. No. 348,016

Claims priority, application Japan, Feb. 16, 1981, 56-20210

Int. Cl.³ H04N *5/50*

U.S. Cl. 358—195.1 **4 Claims**



1. A receiving circuit for a television receiver for receiving an FM-modulated television signal, comprising:

a mixer circuit, supplied with an FM-modulated television signal of a first frequency band and a local oscillation signal from a local oscillator circuit, for converting said FM-modulated television signal of the first frequency band into a television signal of a second frequency band in accordance with said local oscillation signal;

the local oscillator circuit generating the local oscillation signal and applying it to said mixer circuit, a frequency of the local oscillation signal being varied in accordance with a tuning voltage supplied from an external source which represents a channel of the television signal to be received;

an FM detector circuit for FM-detecting the FM-modulated television signal of the second frequency band from said mixer circuit and producing a television composite video signal;

a video amplifier circuit for amplifying the composite video signal from said FM detector circuit;

a sync separation circuit for separating a sync signal from the composite video signal applied thereto from said video amplifier circuit and outputting only said sync signal;

a sampling circuit, supplied with the composite video signal from said FM detector circuit and the sync signal from said sync separation circuit, for picking up the sync signal voltage of said composite video signal in accordance with said sync signal from said sync separation circuit, said sampling circuit producing an output voltage corresponding to the frequency spectrum of the sync signal of the television signal of the second frequency band, and applying it to a hold circuit; and

the hold circuit for holding the output voltage signal from said sampling circuit for a predetermined period, producing a DC voltage corresponding to the output voltage signal from said sampling circuit, and applying said DC voltage to said local oscillator circuit, said DC voltage being superimposed on the tuning voltage applied to said local oscillator circuit and controlling the oscillation frequency of said local oscillator circuit such that the frequency spectrum of the sync signal of the television signal of the second frequency band takes a predetermined value.

4,417,280

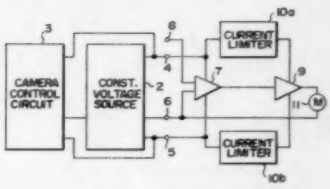
SERVO AMPLIFIER FOR TELEVISION CAMERA LENS

Tsuneo Yokoyama, and Kazumichi Tsuchiya, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Continuation-in-part of Ser. No. 150,433, May 16, 1980, abandoned, which is a continuation of Ser. No. 924,085, Jul. 12, 1978, abandoned. This application Feb. 26, 1982, Ser. No. 352,529

Int. Cl.³ H04N *5/26*

U.S. Cl. 358—227 **2 Claims**



1. A servo amplifier for driving a servomotor in a television camera, said amplifier comprising, in combination, a camera control circuit, a constant voltage source, a current limiter, and a power amplifier, said current limiter comprising in combination, a transistor and zener diode, and means for causing said zener diode to become non-conductive and causing a current to flow only through the transistor in a first mode when the drive current required by said servomotor is relatively low, and for causing said zener diode to become conductive and causing a current to flow through the zener diode and thereby to cause a current for a predetermined level to flow through said transistor in a second mode when the drive current required by said servomotor is greater than a predetermined value.

4,417,281

IMAGE MAGNIFICATION CONTROL MECHANISM FOR FACSIMILE ZOOM LENS

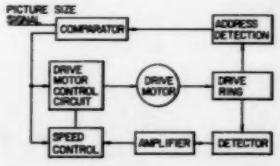
Yoshihiro Hama, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1981, Ser. No. 322,840

Claims priority, application Japan, Nov. 21, 1980, 55-167176

Int. Cl.³ H04N *1/04*

U.S. Cl. 358—287 **11 Claims**



1. In a variable magnification image recording device of the type wherein the image magnification is varied by moving a drive member to vary the position of at least a portion of a zoom lens, an image magnification control mechanism comprising:

detecting means for detecting when said drive member is

positioned at any one of only a finite number of discrete positions corresponding to different image magnifications; and

drive control means for moving said drive member between said finite number of positions.

4,417,282

DOCUMENT INFORMATION FILING SYSTEM

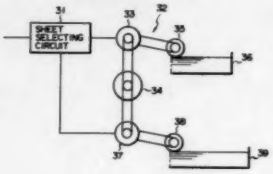
Kazuhiko Yamamoto, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 4, 1981, Ser. No. 318,192

Claims priority, application Japan, Nov. 7, 1980, 55-156720

Int. Cl.³ H04H *1/22*

U.S. Cl. 358—296 **7 Claims**



1. A document information filing system comprising:

means for reading out index information from a recording medium having a plurality of first tracks in which to record various document information and at least one second track in which to record said information at least including an address representing the recording position of document information and a size code representing the size of a document;

sheet size decision means for determining a size of copying sheet depending upon the size code of the index information read out from said reading means and producing sheet size data;

means for selecting a copying sheet of a sheet size corresponding to the sheet size data from said sheet size decision means; and

copying device for reproducing document information on the sheet selected by said sheet selection means.

4,417,283

DIGITAL SIGNAL PROCESSING SYSTEM

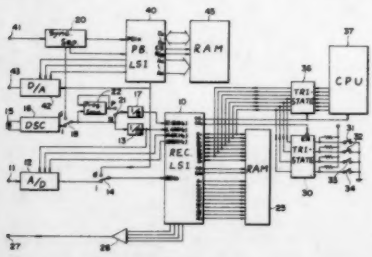
Susumu Hoshimi, Yokohama, and Tadashi Kojima, Yokosuka, both of Japan, assignors to Sony Corporation and Tokyo Shibaura Denki Kabushiki Kaisha, both of, Japan

Filed Jul. 14, 1981, Ser. No. 283,240

Claims priority, application Japan, Jul. 17, 1980, 55-97777

Int. Cl.³ H04N *9/493*

U.S. Cl. 358—310 **11 Claims**



1. A circuit arrangement for processing analog audio data into a format for transmitting, receiving and playing back in a video format comprising, an analog to digital converter receiving said analog audio data, a large scale integration circuit with clock, read-write, input, output, chip select, data and address terminals, receiving the output of said analog to digital converter, a random access memory connected to said read-write, data and address terminals of said large scale integration circuit, a first tri-state buffer attached to supply outputs to certain of said data terminals of said large scale integration circuit and receiving an input from one of said chip select terminals and a first plurality of switches connected to said first tri-state buffer.

4,417,284

GAIN CONTROL CIRCUIT FOR A VIDEO TAPE RECORDER WHEREIN THE CHROMINANCE IS GAIN CONTROLLED IN RESPONSE TO THE LUMINANCE SIGNAL AS WELL AS THE CHROMINANCE SIGNAL

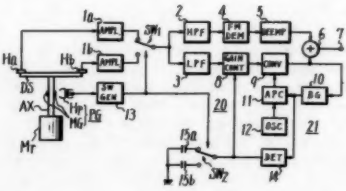
Ichitaro Sato, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 27, 1981, Ser. No. 257,625

Claims priority, application Japan, Apr. 29, 1980, 55-56878

Int. Cl.³ H04N *9/491*

U.S. Cl. 358—316 **9 Claims**



1. A signal reproducing circuit for an under-chroma recording and/or reproducing system, comprising: transducer head means for reproducing a composite color video signal from a recording medium, signal separating means connected to said transducer head means for separating an FM luminance signal and a chrominance signal from said reproduced composite color video signal, demodulating means provided in a signal path of said separated FM luminance signal for demodulating it, first gain control means provided in a signal path of said separated chrominance signal for controlling the signal level of the chrominance signal and receiving a reference signal included in said chrominance signal, level detecting means connected to the output of said demodulating means and detecting the level of said demodulated luminance signal, and a gain control signal generating means receiving the output of said level detecting means and supplying an input to said first gain control means so as to control the signal level of said chrominance signal in response to the detected level of said luminance signal, wherein said first gain control means includes capacitance means for applying a proper time constant to a signal level control loop based on said reference signal of the chrominance signal, wherein said capacitance means is connected to a reference potential through a resistance means, and the output of said gain control signal generating means supplied to the junction point between said capacitance means and said resistance means.

4,417,285

STOP MOTION SYSTEM FOR PLAYING BACK A PROGRAM RECORDED ON A DISC-SHAPED RECORD CARRIER

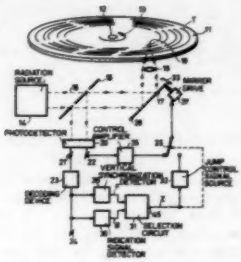
Johannes A. M. Mes, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 9, 1977, Ser. No. 795,239

Claims priority, application Netherlands, Mar. 17, 1977, 02874

Int. Cl.³ H04N *5/85*

U.S. Cl. 358—342 4 Claims



1. A system for playing back a TV signal from a disc-shaped record carrier, said TV signal having been recorded as a sequence of sets of fields, two fields of said sets of fields having been recorded per track circumference, consecutive scenes of the TV signal corresponding to consecutive sets of two and three fields in accordance with a specific pattern, at least one of said track circumferences thereby containing recorded information corresponding to two consecutive scenes of the TV signal, successive indication signals recorded on said disc during vertical blanking periods and separated by both even and odd numbers of fields, said read apparatus comprising stop-motion means operable in a still picture mode of the apparatus for repeatedly scanning two selected consecutive fields, detection means for sensing said indication signals, and selection means connecting said detection means to said stop-motion means for controlling said stop-motion means to separately scan under the control of said indication signals only those sets of two consecutive fields that correspond to a single scene of the TV signal.

4,417,286

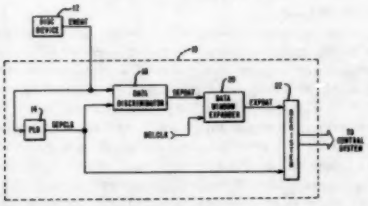
DATA WINDOW EXPANDER CIRCUIT IN A DATA RECOVERY SYSTEM

Douglas B. Anderson, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 31, 1981, Ser. No. 288,850

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—51 7 Claims



1. In a data recovery system for recovering a separated data signal and a separated clock signal from an encoded data signal, where each bit cycle of the separated data signal has a data window portion for indicating the data value of that bit cycle, the improvement comprising:

a data window expander circuit for expanding the data window portion of each bit cycle, said data window expander circuit including delay means for delaying the separated data signal and logic gate means for logically combining the separated data signal and the delayed separated data signal in order to provide a recovered data signal having an expanded data window portion.

4,417,287

HELICAL SCAN VIDEO TAPE RECORDER HEAD START-UP

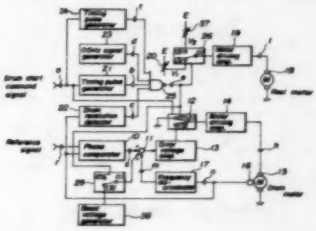
Masao Ishikura, Akigawa, Japan, assignor to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,907

Claims priority, application Japan, Oct. 29, 1980, 55-150778

Int. Cl.³ G11B *21/04*

U.S. Cl. 360—71 5 Claims



1. A helical scan type video tape recorder having a revolving drum equipped with magnetic heads, comprising: means to create fluctuations in the starting torque for the revolving head drum motor; and means to simultaneously create fluctuations in the torque for a reel motor at the time of start-up of said revolving drum for fluctuating the tension in the magnetic tape in synchronization with the fluctuations in the starting torque for said drum motor, thereby assuring execution of start-up of said revolving drum.

4,417,288

BROKE FOR MAGNETIC DISC DRIVE APPARATUS

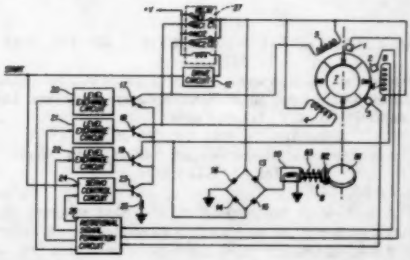
Toshiaki Hattori, and Yasuichi Hashimoto, both of Oume, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 9, 1981, Ser. No. 328,998

Claims priority, application Japan, Dec. 18, 1980, 55-178012

Int. Cl.³ G11B *19/22*

U.S. Cl. 360—74.1 8 Claims



1. A rotation control device for a magnetic disc drive apparatus comprising:

a direct current motor for driving a magnetic disc;

electrical braking means for regeneratively braking said motor;

electro-mechanical braking means coupled to said motor and actuable at a predetermined motor speed;

control means for actuating said electrical braking means to produce regenerative braking of said motor and for actuating said electro-mechanical braking means when said motor has reached a motor speed at or below said predetermined motor speed.

4,417,289

JACKET FOR FLOPPY PACK

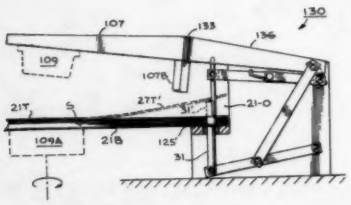
Herbert U. Ragle, Thousand Oaks, and Dean DeMoss, Camarillo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 1,978, Jan. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 711,579, Aug. 4, 1976, Pat. No. 4,134,144. This application Feb. 2, 1981, Ser. No. 230,217

The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.

Int. Cl.³ G11B *23/02, 25/04*

U.S. Cl. 360—98 **15 Claims**



1. Jacket container means adapted to house a prescribed pack of flexible disk records and to accommodate the rotation and partition of the pack, within the jacket as well as accommodating the selectible introduction of transducer means to operate upon this pack, and also adapted to accommodate registration within associated automatic disk drive apparatus automatically so-rotating, partitioning and transducing this pack, this said container means comprising: a pair of like panel means joined along two opposing edges

by a pair of like side-wall means and further joined along an intermediate bottom-edge by bottom-wall means;

said wall means all being dimensioned and adapted to accommodate the full partitioned height of said pack when so operated in situ and also being configured and adapted to be automatically non-rotatably positioned in said apparatus for automatically carrying out said operations.

4,417,290

MULTI-LAYER MAGNETO-OPTICAL RECORDING MEDIUM

Shinsuke Tanaka, Kawasaki; Nobutake Imamura, Tokyo, and Chuichi Ota, Fuchu, all of Japan, assignors to Kokusai Denshindenwa Co., Ltd., Tokyo, Japan

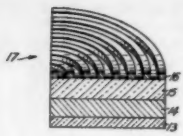
Filed Aug. 19, 1981, Ser. No. 294,310

Claims priority, application Japan, Aug. 25, 1980, 55-115847

Int. Cl.³ G11B *5/74*

U.S. Cl. 360—131 **1 Claim**

1. A multi-layer magneto-optical recording medium comprising a magneto-optical recording substrate wherein an easy axis of magnetization is provided perpendicular to a film surface and the direction of magnetization is perpendicular to the film surface to take a binary code depending on whether the direction of magnetization is upward or downward, a transparent protective film placed upon said magneto-optical recording substrate and a metal film having a melting point lower than that of both said transparent protective film and said magneto-



optical recording substrate is disposed upon said transparent protective film.

4,417,291

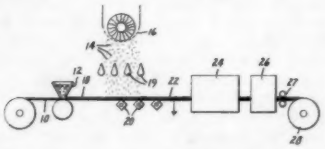
RECORDING DISKETTE HAVING FLOCKED-FIBER WIPING FABRIC

Richard L. Miklos, and Craig F. Lamphere, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 106,753, Dec. 26, 1979, abandoned. This application Sep. 14, 1981, Ser. No. 302,293

Int. Cl.³ G11B *23/02, 25/04*

U.S. Cl. 360—133 **10 Claims**



1. Improved diskettes, each of which comprises a thin jacket containing a flexible recording disk and a wiping fabric bonded to the jacket in facing relationship to the disk, wherein the improvement comprises:

(a) the wiping fabric being comprised of a layer of short, closely-spaced fibers, one end of each fiber being bonded directly to the jacket; and

(b) diskette jacket walls which do not vary in thickness more than 3 mils.

4,417,292

POWER AMPLIFIER PROTECTION CIRCUIT

Valerio Borghese, Sedriano; Pietro Erratico, Milan, and Silvano Coccetti, Vittuone, all of Italy, assignors to SGS-ATES Componenti Elettronici SpA, Milan, Italy

Filed May 13, 1982, Ser. No. 377,994

Claims priority, application Italy, May 28, 1981, 21999 A/81

Int. Cl.³ H02H *3/26*; H03F *3/04*

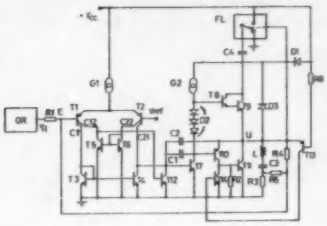
U.S. Cl. 361—87 **4 Claims**

1. A circuit arrangement for the protection of the final stage of a monolithic integrated circuit power amplifier used for providing the vertical deflection of a television picture tube, said amplifier comprising a number of amplifying stages including a differential input stage and a current amplifier final stage, said differential input stage having a first input connected to an output of a sawtooth signal source and a second input connected to a reference voltage source, said final stage being connected to a flyback signal generator and connected to a load comprising a picture tube deflection control circuit, an output of the final stage and said first input of said differential amplifier stage being connected to each other by a feedback network, said circuit arrangement comprising:

a circuit means for sensing any imbalance in currents flowing in said differential stage of opposite sign to an imbalance in

said currents due to a front portion of a sawtooth signal output from sawtooth signal source, said circuit means capable of generating, as its output, a protective signal at the beginning of said imbalance of opposite sign, and

a controlled electronic switch, which is normally open, and which is connected across input terminals of a predetermined stage among said number of amplifying stages in said amplifier;



wherein a control terminal of said switch is connected to the output of said circuit means so as to close during the appearance of said protective signal, thereby protecting said final stage of said amplifier.

4,417,293

METHODS AND APPARATUS FOR TRANSFERRING ELECTRIC CHARGES OF DIFFERENT SIGNS INTO A SPACE ZONE, AND APPLICATION TO STATIC ELECTRICITY ELIMINATORS

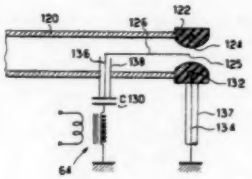
Serge Larigaldie, Chatenay Malabry, France, assignor to Office National d'Etudes et de Recherches Aerospatiales, France

Filed Oct. 7, 1981, Ser. No. 309,374

Claims priority, application France, Oct. 14, 1980, 80 21977

Int. Cl.³ H05F *1/00*

U.S. Cl. 361—212 **11 Claims**



1. An apparatus for introducing bipolar charges into a region of space, comprising:

an enclosure;

means adapted to feed said enclosure with a pressurized gas, charged with a substance adapted to change phase by cooling when said gas is caused to expand;

a body arranged in said enclosure for defining a nozzle to the exterior, said body comprising an electrically conducting member close to said nozzle, and the surface of said nozzle being electrically insulating;

a tapered electrode, the apex of which is situated close to the neck of the nozzle;

means for applying an AC high voltage between said electrically conducting member and said tapered electrode, said means for applying comprising a capacitor in series, thereby producing a corona discharge between said apex of the tapered electrode and said nozzle;

whereby the gas is ionized with bipolar charges substantially equilibrating each other, and then expands past the nozzle, while said substance changes phase and carries said equilibrating bipolar charges over a distance to a region of space.

4,417,294

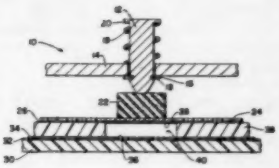
CAPACITIVE KEYSWITCH

John R. Herron, Jr., Park Ridge, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 28, 1981, Ser. No. 297,439

Int. Cl.³ H01G *5/01*; H01H *3/12*

U.S. Cl. 361—288 **3 Claims**



1. A capacitive keyswitch comprising a first circuit support, an electrically insulating spacer, a dielectric structure, a second circuit support, and actuating means for actuating the keyswitch; said first circuit support being flexible and carrying thereupon a first conductive circuit, said first conductive circuit including a first conductive land; said second circuit support carrying thereupon a second conductive circuit, said second conductive circuit including a second conductive land; said spacer having an aperture therethrough; said first conductive land, said second conductive land, and said aperture being substantially in register with said first conductive land and said second conductive land being in facing relation with respect to each other; said dielectric structure being interposed between said first and second conductive lands; said actuating means comprising a plunger and a pad; said pad being interposed between said plunger and said first circuit support whereby application of a force urging said plunger toward said first circuit support urges said pad against said first circuit support and through said pad, urges said first circuit support toward said second circuit support, whereby capacitance between said first conductive land and said second conductive land is varied as said force is varied.

4,417,295

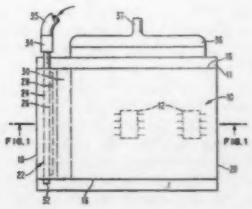
AIR JET POWERED COOLING SYSTEM FOR ELECTRONIC ASSEMBLIES

Paul E. Stuckert, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 3,334, Jan. 14, 1979, abandoned, which is a continuation of Ser. No. 811,755, Jun. 30, 1977, abandoned. This application Aug. 27, 1982, Ser. No. 412,340

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—384 **6 Claims**



1. A cooling apparatus and a plurality of circuit cards, said cooling apparatus having cooling air driven only by compressed air and being characterized in that each circuit card

carries with it an individual cooling system driven entirely by compressed air, said individual compressed air cooling systems each comprising:

a shroud mounted on a circuit card, said shroud and circuit card together forming an individual cooling air duct for cooling said circuit card, said cooling air duct having an inlet opening admitting cooling air, an outlet opening exhausting air warmed by said circuit card, and an air flow path connecting said inlet opening to said outlet opening;

a compressed air nozzle mounted effectively within said individual air duct for common movement therewith and producing an air jet, said air jet driving cooling air along said air flow path; and

compressed air tubing having an end connected to said compressed air nozzle for providing compressed air to said compressed air nozzle,

whereby said individual compressed air cooling systems may have different cooling capacities, each adapted to the individual cooling requirements of the circuit card carrying said individual cooling system, and whereby each said circuit card receives forced air cooling regardless of physical position so long as the individual cooling system it carries receives compressed air.

4,417,296

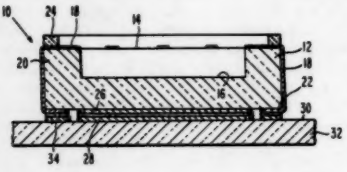
METHOD OF CONNECTING SURFACE MOUNTED PACKAGES TO A CIRCUIT BOARD AND THE RESULTING CONNECTOR

Robert L. Schelhorn, 270 Locust La., Cinnaminson, N.J. 08077

Continuation-in-part of Ser. No. 59,991, Jul. 23, 1979, abandoned. This application Oct. 26, 1980, Ser. No. 190,985

Int. Cl.³ H05K 1/18

U.S. Cl. 361—386 **17 Claims**



1. A connector, for securing a surface mounted package of the type having a first plurality of electrical contact pads on one surface thereof to a circuit board of the type having a second plurality of electrical contact pads on one surface thereof, said first plurality of electrical contact pads corresponding in size and relative location to said second plurality of electrical contact pads, when aligned for bonding, said connector being adapted for use with a surface mounted package having a different coefficient of thermal expansion than the circuit board to which it is attached and comprising:

first thermal buffer pad means on said one surface of said surface mounted package;

second thermal buffer pad means on said one surface of said circuit board, said first and second thermal buffer pads being configured to have their bonding areas aligned when said first and second pluralities of electrical contact pads are aligned and said first and second thermal buffer pad means each having a substantially larger bonding area than one of said plurality of electrical contacts;

said thermal buffer pads have coefficients of thermal expansion which are intermediate those of said surface mounted package and said circuit board; and

means between corresponding members of said first plurality of electrical contact pads and said second plurality of electrical contact pads and between said first thermal buffer pad means and said second thermal buffer pad means for bonding each pad of the surface mounted package to the aligned pad of the circuit board with the electrical contacts on said package electrically connected to said corresponding electrical contacts on said circuit board.

4,417,297

PRINTED CIRCUIT BOARD

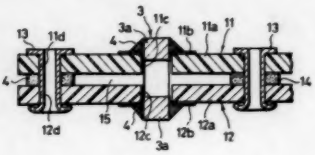
Kohei Oyama, and Hiroyuki Yokouchi, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jul. 2, 1981, Ser. No. 279,687

Claims priority, application Japan, Jul. 8, 1980, 55-95812[U]

Int. Cl.³ H05K 1/14

U.S. Cl. 361—412 **6 Claims**



1. A printed circuit board for mounting chip components, comprising first and second printed substrates stacked over one another and each having conductive wiring patterns formed on the surfaces thereof facing outwardly, said first and second printed substrates having aligned holes extending between respective conductive wiring patterns of each said substrate and receiving therein respective chip components, said chip components having a coefficient of thermal expansion different than that of said first and second printed substrates and being soldered to said wiring patterns, and means including spacer members located between said first and second printed substrates for providing a spacing between said first and second printed substrates around said holes so that thermal stresses developed between said printed substrates and any of said chip components can be relieved by relative movement between said printed substrates to vary said spacing.

4,417,298

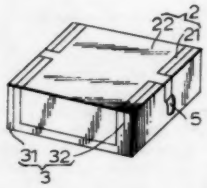
CHIP TYPE TANTALUM CAPACITOR

Koreaki Nakata, 12-27, Mefugaoka, Takarazuka-shi, Hyogo-ken; Tsunehiko Todoroki, 231-37, Matsukasa-cho, Yamatokoriyama-shi, Nara-ken; Masahiro Oita, 3-4-18, Kamiichi, Kashiwara, and Nobumasa Oshima, 3-19-5, Hirakata, all of Japan

Filed May 16, 1980, Ser. No. 150,656

Int. Cl.³ H01G 9/00

U.S. Cl. 361—433 **3 Claims**



1. A chip type tantalum capacitor comprising:

an insulating resin frame;

a pair of substantially flat metal foil terminals bonded to both sides of said frame, at least one of said frame sides having a slit therethrough an open to the outside of said metal foil terminal on said one frame side, said metal foil terminal on said one frame side being a metal selected from the group consisting of copper and nickel;

a tantalum capacitor element having a pair of terminals and

enclosed in said frame, at least one of said element terminals being a lead wire made of tantalum, said lead wire extending through said slit and outside said metal foil terminal on said one side of said frame and being bent at the outside surface of said metal foil terminal with the bent portion of the lead wire outside said metal foil terminal extending along the surface of said metal foil terminal and being welded to said metal foil terminal surface for being fixed thereto, the other element terminal being electrically connected to the other metal foil terminal; and

an insulating resin potted in the space inside said frame and around said capacitor element.

4,417,299

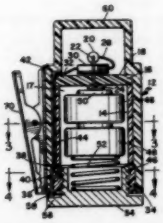
FISHING POLE LIGHT

John W. Rupp, 3131 Central Ave., Spring Valley, Calif. 92077

Filed Mar. 22, 1982, Ser. No. 360,219

Int. Cl.³ F21L 7/00

U.S. Cl. 362—186 **7 Claims**



1. A portable, small, long life, lightweight fishing pole light, comprising:

a hollow, cylindrical central member of insulating material closed at one end by a disk of insulating material having a reflective outer face with a light emitting diode extending above said face, said light emitting diode having a first electric lead extending from one terminal centrally through said disk and forming a first electrical contact means for contacting one electrode of battery means and a second electric lead extending from the other light emitting diode terminal through a resistor to switch means;

an outer case of insulating material extending over said central member and having at least its forward end portion transparent to provide a lens;

the interior of said hollow central member forming a battery compartment for seating battery means therein;

spring means in said battery chamber for urging said battery means to engage said first electrical contact mena;s

cap means for closing said battery chamber;

switch means for completing a circuit between said first electrical contact means and second electrical contact means positioned to contact the other electrode of said battery means; and

fastening means on the outer case for fastening said light near the end of a fishing rod;

whereby said light emitting diode is energized by actuating said switch means.

4,417,300

REFLECTOR FOR UNIFORMLY ILLUMINATING AN AREA, PARTICULARLY A FILM WINDOW OF A FILM OR SLIDE PROJECTOR, AND REFLECTOR LAMP

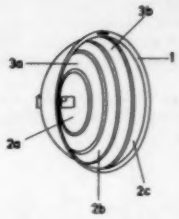
Albert Bodmer, Munich, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Jun. 19, 1981, Ser. No. 275,151

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1980, 3027719

Int. Cl.³ F21V 7/00

U.S. Cl. 362—304 **13 Claims**



1. A reflector for illuminating an area,

wherein

the reflector is essentially cup-shaped and has at least two contours forming a reflector system;

each contour defines a circumferential band or strip rotation-symmetrical with respect to the optical axis of the total system; the generatrices of the said contours follow elliptical curves;

the reflector is divided into zonal regions;

successive zonal regions lie on different contours;

and the area proportions F_A and F_B of the contours A and B of the entire reflective area F satisfy the equations $F_A = x$ F and $F_B = (1-x)$ F, with $0.2 \leqq x \leqq 0.8$.

4,417,301

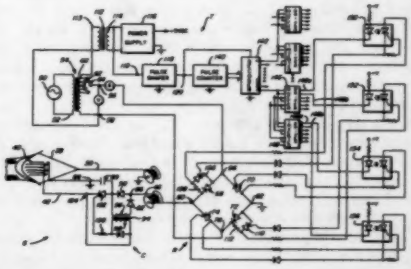
METHOD AND APPARATUS FOR ELECTRIC FISH TRAWLING

James L. Newman, 970 Stacewood, Beaumont, Tex. 77706

Filed Sep. 18, 1981, Ser. No. 303,353

Int. Cl.³ H02M 7/155

U.S. Cl. 363—129 **43 Claims**



1. An electrical circuit for providing high voltage level electrical pulses to an electrode for electrical bottom fishing, comprising:

means for storing electrical charge;

a source of alternating polarity electrical power for charging said charge storing means, said source having a positive half-cycle and a negative half-cycle;

full-wave rectifying means, between said power source and said charge storing means for rectifying power from said

alternating polarity power source and providing charging current to said charge storing means during both the positive half-cycle and the negative half-cycle of said power source;

current reversing means for selectively reversing the direction of current to said charge storing means;

switching means responsive to said reversal of current to said charge storing means, for connecting said charge storing means to the electrode, thereby allowing said charge storing means to discharge through the electrode.

4,417,302

BYPASS FOR PRIORITIZING INTERRUPTS AMONG MICROPROCESSORS

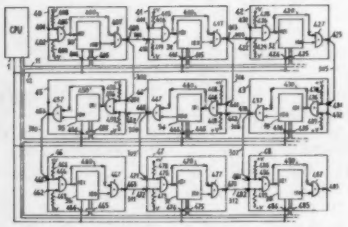
Domenico Chimienti, Vanzago, and Arturo Vercesi, Rho, both of Italy, assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Aug. 28, 1980, Ser. No. 182,163

Claims priority, application Italy, Aug. 30, 1979, 25356 A/79

Int. Cl.[3] **G06F** *15/16, 15/40, 9/22*

U.S. Cl. 364—200 **1 Claim**



1. A multiprocessor system including a central processor and a plurality of peripheral processors coupled to said central processor through a common bus, said central processor providing an interrupt servicing signal on said bus in response to an interrupt request signal generated by any one of said peripheral processors and received by said central processor through an interrupt line connecting said peripheral processors and said central processor, each of said peripheral processors having an input for receiving an interrupt enable signal and an output for delivering an interrupt enable signal, each peripheral processor being enabled to generate an interrupt request when receiving said interrupt enable signal on said input, each peripheral processor delivering said interrupt enable signal on said output when both receiving said interrupt enable signal on said first input and not generating said interrupt request signal, said multiprocessor system comprising further a bypass network for prioritizing interrupts among processors, said bypass network comprising:

a plurality of AND gating means, one for each peripheral processor, each one having a first and a second input and an output, said gating means output being connected to said input of the related peripheral processor; and

a plurality of connections of said peripheral processor outputs with said first and said second inputs of said gating means, said peripheral processors being logically ordered in a matrix of M lines and N columns, with a descending priority by line order, the peripheral processors in the odd lines having a descending priority by column order and the peripheral processors in the even lines having an increasing priority by column order;

said plurality of connections connecting the output of each peripheral processor Pik of a line i and column k of said matrix, with said first input of the gating means related to the peripheral processor Pi,K±1 of the same line, but of the contiguous K+1 column, if i is odd, K−1 column if i is even, and with said second input of the gating means related to the peripheral processor Pi+1,k of the following line and column.

4,417,303

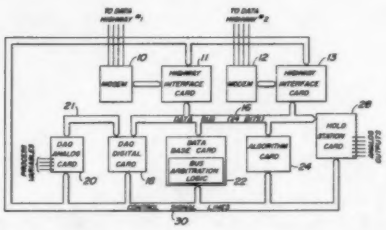
MULTI-PROCESSOR DATA COMMUNICATION BUS STRUCTURE

Simon Korowitz, Hatfield; Kurt R. Leichter, King of Prussia, and Felix J. Houvig, Wayne, all of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Feb. 25, 1981, Ser. No. 237,835

Int. Cl.[3] **G06F** *15/16*

U.S. Cl. 364—200 **3 Claims**



1. A data communications system for transferring logically related pieces of information between the local buses connected to each of a plurality of independently operated processors and a resource, comprising:

a data bus interconnecting the local buses of said processors and said resource, said data bus being capable of carrying in parallel a number of bytes each having bit length corresponding to that of the natural transfer mechanism of said processors;

reading latch means associated with each processor and connected between the processors' local bus and said data bus for storing all of the bytes being simultaneously transferred over said data bus; and

control logic means including,

means operable during a first part of a read from the data bus by a processor to cause the latch means for said processor to latch up all simultaneously transferred bytes from said data bus while allowing one of said simultaneously transferred bytes to go to the local bus connected to said latch means, and

means operable during a subsequent part of a read to transfer latched data of another of said simultaneously transferred bytes to said local bus.

4,417,304

SYNCHRONOUS CYCLE STEAL MECHANISM FOR TRANSFERRING DATA BETWEEN A PROCESSOR STORAGE UNIT AND A SEPARATE DATA HANDLING UNIT

John M. Dinwiddie, Jr., Loxahatchee, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 62,262, Jul. 30, 1979, abandoned. This application Nov. 13, 1981, Ser. No. 321,132

Int. Cl.[3] **G06F** *3/00*

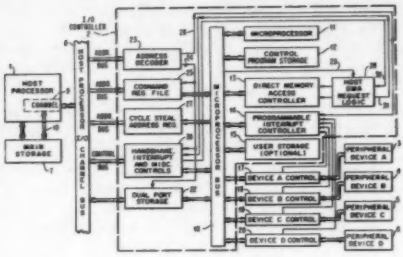
U.S. Cl. 364—200 **9 Claims**

1. In a data processing system having a processor unit and a random access storage unit associated with and coupled to it and wherein the processor unit provides for each of its machine cycles an address set-up indicative pulse denoting the occurrence of a processor address set-up interval during a portion of each machine cycle, a cycle steal mechanism for transferring data between a separate data handling unit and the processor storage unit without interrupting a program being executed by the processor unit and comprising:

selectively operable signal transfer circuitry for transferring

address bits from the data handling unit to the address terminals of the processor storage unit and for providing a data transfer path between the data handling unit and the data terminals of the processor storage unit;

and cycle steal control circuitry responsive to the occurrence of both a transfer request indicative signal from the data handling unit and an address set-up indicative pulse from the



processor unit for activating during the processor address set-up interval of the processor machine cycle the selectively operable signal transfer circuitry for enabling the transfer of data from the data handling unit to the processor storage unit or vice versa during a portion of the processor machine cycle when the processor unit itself is not actually moving data to or from the processor storage unit.

4,417,305

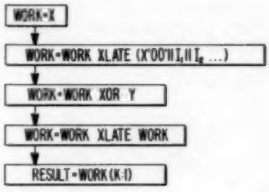
METHOD FOR EVALUATING BOOLEAN EXPRESSIONS

Viktors Berstis, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 8, 1981, Ser. No. 300,133

Int. Cl.³ G06F *7/00*

U.S. Cl. 364—300 **6 Claims**



1. Method for evaluating boolean expressions in a computer system comprising:

forming a first constant from the expression to specify rearrangement of the variables,

setting said first constant into a work area,

translating said first constant in said work area using the variables as a translate table,

forming a second constant from the expressions where the second constant functions to change the values of the variables to position numbers having values one less and two less than the position number of the variable and where the second constant changes the zeros between variables into position numbers which point to previous positions in the result string containing values of previously evaluated subexpressions,

logically combining said translated first constant with said second constant using an exclusive OR operation, and

translating the result of the exclusive OR operation using the result as the translate table as the result is changing during the translation, the result from last translation in the result being the value of the boolean expression being evaluated

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4,417,306

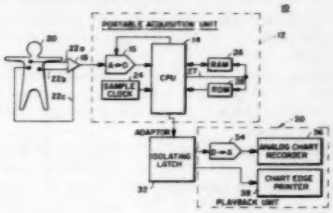
APPARATUS FOR MONITORING AND STORING UTILIZING A DATA PROCESSOR

Paul Citron, New Brighton; Dennis G. Hepp, Coon Rapids, and Thomas L. Jirak, Plymouth, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 114,595, Jan. 23, 1980, abandoned. This application Jan. 7, 1982, Ser. No. 337,991

Int. Cl.³ G06F *15/42*; A61B *5/04*

U.S. Cl. 364—415 **39 Claims**



1. Apparatus for monitoring and comparing electrical signals indicative of a patient's heart activity, with criteria indicative of regular heart activity comprising a defined relationship between one and a subsequent R-R interval, said apparatus comprising:

(a) means for measuring in real time a patient's heart activity and for providing a sequence of discrete R-R interval signals, each signal indicative of the time interval between successive peaks of the patient's heart activity;

(b) means coupled to said monitoring means forreceiving the R-R interval signals and for storing a continuously updated set of the R-R interval signals; and

(c) evaluating means for examining selected of said updated set of R-R intervals with each other in accordance with said defined relationship to provide a manifestation indicative that the patient's heart activity is regular or irregular.

4,417,307

AUTOMATIC TRANSMISSION WITH ELECTRICAL OVERRIDE

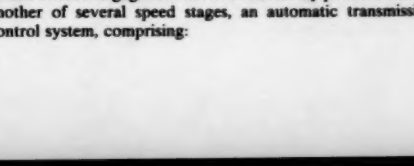
Seitoku Kubo; Yukio Terakura; Shinya Nakamura, all of Toyota, and Ken Asami, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 17, 1980, Ser. No. 169,637

Claims priority, application Japan, Aug. 21, 1979, 54-106790

Int. Cl.³ G05D *29/00*; B60K *41/08, 41/22*

U.S. Cl. 364—424.1 **6 Claims**



1. For an automatic transmission, for a vehicle including an engine, a gear transmission mechanism having several speed stages, a plurality of hydraulic fluid pressure actuated friction engagement devices, which according to selective engagement of said friction engagement devices selectively provides one or another of several speed stages, an automatic transmission control system, comprising:

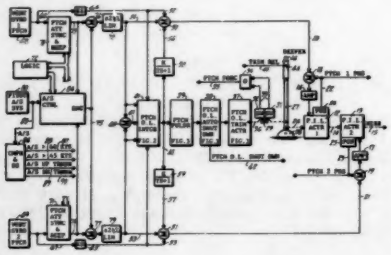
(a) a source of pressurized hydraulic fluid;
(b) a line hydraulic fluid pressure control valve which regulates said pressurized hydraulic fluid to produce a controlled line pressure;
(c) a throttle hydraulic fluid pressure control valve which regulates said line pressure to produce a throttle pressure having a pressure value corresponding to vehicle engine load;
(d) a governor hydraulic fluid pressure control valve which regulates said line pressure to produce a governor pressure having a pressure value corresponding to vehicle road speed;
(e) a plurality of speed shift valves which selectively supply actuating hydraulic fluid pressures to said hydraulic fluid pressure actuated friction engagement devices, according to the current values of said throttle pressure and said governor pressure which act in opposition on each of said speed shift valves;
(f) a vehicle speed sensor which generates an electrical signal related to vehicle road speed;
(g) a throttle sensor which generates an electrical signal related to vehicle engine load;
(h) an electrically operated override valve which selectively outputs an override pressure, said override pressure being supplied to one of said speed shift valves so as partly to modify the performance thereof; and
(i) an electrical computing device which supplies said electrical signal to said electrically operated override valve according to the electric signals produced by said vehicle speed sensor and said throttle sensor.

4,417,308

DUAL INNER LOOP FAULT INHIBIT OF AIRCRAFT OUTER LOOP

Stuart C. Wright, Milford; Don L. Adams, Fairfield; William C. Fischer, Monroe, and David J. Verzella, Guilford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 30, 1981, Ser. No. 249,274
Int. Cl.³ G06F *15/50*; G06G *7/70*
U.S. Cl. 364—434 **2 Claims**



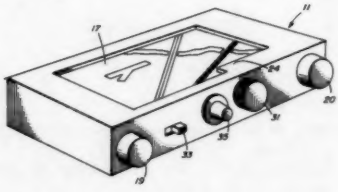
1. A system for automatically positioning aerodynamic surfaces in a control axis of an aircraft, comprising:
a sensor indicative of a parameter of aircraft flight related to said control axis for providing a parameter signal indicative of the magnitude thereof;
a pair of fast, inner loop actuators serially connected for changing the position of said aerodynamic surfaces across a limited authority range of positions which is a fraction of the total permissible range of positions thereof;
a position detector for each of said inner loop actuators, each providing a signal indicative of the position of the corresponding actuator;
an outer loop actuator connected to said inner loop actuators for adjusting the position of said inner loop actuators relative to the position of said control surfaces throughout a full authority range of positions equal to the total permissible range of positions thereof, to thereby reposition the center of said limited authority range relative to said full authority range; and
signal processing means, connected for response to said sensor, for providing a reference signal indicative of a desired magnitude of said parameter, for providing a proportional command signal indicative of the magnitude and sense of the difference between said parameter signal and said reference signal to adjust the position of said inner loop actuators and therefore of said control surfaces in a first direction, depending on the sense of said difference, to cause said parameter signal to approach equality with said reference signal, for providing, to said each of inner loop actuators, a rate command signal indicative of the magnitude and sense of the rate of change of said parameter signal to adjust the position of said conrol surfaces in a second direction, depending on the sense of said rate of change, to cause the rate of change of said parameter signal to approach nil, and for providing said proportional command signal to said inner loop actuators and to said outer loop actuator;
characterized by said signal processing means comprising means for providing a shut down signal in response to the difference between said position signals being in excess of a predetermined magnitude, and for inhibiting provision of said proportional command signal to said outer loop actuator in response to said shut down signal.

4,417,309

AIRCRAFT NAVIGATION COMPUTER

Philip C. Harvey, 17 Michael Ave., Nashua, N.H. 03062

Filed Feb. 13, 1981, Ser. No. 234,404
Int. Cl.³ G06F *15/50*
U.S. Cl. 364—450 **14 Claims**



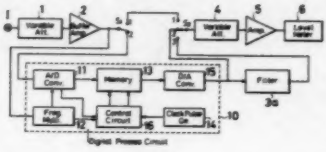
1. Navigation apparatus comprising:
an enclosure;
a pair of manually driven rollers for receiving and scrolling a map strip from one point on said enclosure to another point;
intermediate said points, wheel means adapted to frictionally engage said map strip and be driven thereby;
translation means, driven by said wheel means, so that the setting of said translation means is varied by movement of said map strip thereby to generate a first voltage which is in proportion to the set postion of said map strip;
means for generating a second voltage, which second voltage varies as a function of the passage of time; and
means for providing a perceptable indication of the relative values of said first and second voltages.

4,417,310

APPARATUS FOR MEASURING DISTORTION FACTOR

Kiyoyuki Sugihara, Tokorozawa, Japan, assignor to Shibasoku Company Limited, Tokyo, Japan

Filed Mar. 17, 1981, Ser. No. 244,560
Claims priority, application Japan, Mar. 29, 1980, 55-40815; Apr. 15, 1980, 55-49783
Int. Cl.³ H04B 3/46; G06F 15/20
U.S. Cl. 364—481 29 Claims



1. An apparatus for measuring a distortion factor of an analog input signal comprising:

means for receiving the input signal and multiplying its frequency to produce a sampling signal;

analog to digital converting means for receiving the input signal and converting its instantaneous values into digital values each time the sampling signal is supplied from the frequency multiplying means;

memory means for receiving the converted digital values and storing them at given address positions;

means for controlling the writing and reading operation for the memory means;

means for reading the ditital values stored in the memory means with a given time interval;

digital to analog converting means converting the read out digital values into analog signals;

filter means for receiving the converted analog signals and selectively eliminating a given frequency component of the analog signals to produce an output signal;

metering means for receiving said output signal from the filter means and detecting a level of the output signal; and

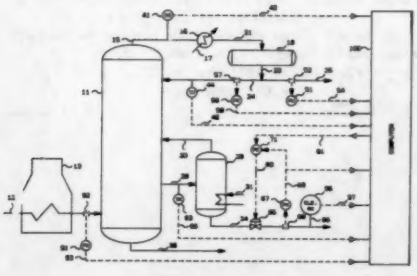
means for calibrating the gain of the metering means in accordance with the input signal level whereby the distortion factor of the input signal is measured as a ratio between the detected level of the output signal and a fundamental level of the input signal.

4,417,311

FRACTIONAL DISTILLATION COLUMN CONTROL

Lawrence A. Ryan, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 29, 1982, Ser. No. 344,146
Int. Cl.³ B01D 3/42
U.S. Cl. 364—501 5 Claims



1. Apparatus comprising:

a fractional distillation column;

means for providing a feedstream to said fractional distillation column;

means for withdrawing a side draw stream from an intermediate portion of said fractional distillation column, wherein at least a portion of said side stream is utilized to provide a side draw product stream;

computor means for enabling establishment of a first signal representative of the actual internal reflux to vapor ratio in said intermediate portion of said fractional distillation column;

computor means for enabling establishment of a second signal representative of the calculated actual cloud point of said side draw product stream in response to said first signal;

means for measuring the cloud point of said side draw product stream and for establishing a third signal representative of the measured actual cloud point of said side draw product stream;

computor means to enable utilization of said third signal to correct any error in the cloud point represented by said second signal to thereby establish a fourth signal representative of a corrected actual cloud point of said side draw product stream;

means for establishing a fifth signal representative of the desired cloud point of said side draw product stream;

means for comparing said fourth signal and said fifth signal and for establishing a sixth signal which is responsive to the difference between said fourth signal and said fifth signal; and

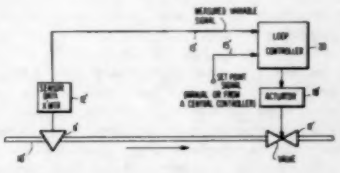
means for controlling the cloud point of said side draw product stream in response to said sixth signal.

4,417,312

ELECTRONIC CONTROLLER FOR VALVE ACTUATORS

Gerald F. Cronin, Worcester, and Howard J. Fuller, Shrewsbury, both of Mass., assignors to Worcester Controls Corporation, West Boylston, Mass.

Filed Jun. 8, 1981, Ser. No. 271,306
Int. Cl.³ G05B 11/00
U.S. Cl. 364—510 14 Claims



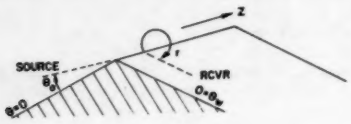
1. An electronic controller for use in a process control system to control the energization of an electrical actuator, said actuator being of the type having a first input which when energized causes said actuator to move in one direction and a second input which when energized causes the actuator to move in the opposite direction, and said actuator being adapted to be connected to a valve operative to vary the flow of a fluid in a controllable process thereby to control the magnitude of a predetermined parameter in said process, said controller comprising input means for receiving first and second electrical signals, said first signal being produced by a process sensor which monitors the existing magnitude of said predetermined parameter in the process being controlled and said first signal being representative of the instantaneous magnitude of the said process parameter, the said second signal being a set signal representative of a desired magnitude of said process parameter, said first and second signals each being substantially independent of the instantaneous positions of said valve and actuator, comparison means coupled to said input means for producing a process parameter error signal when there is a difference between said first and second signals, power supply means for

producing a train of power pulses, means responsive to the sense of said process parameter error signal for coupling said power supply means to a selected one of said actuator inputs thereby to determine the direction of movement of said actuator and to cause said actuator to move in said direction in a series of incremental steps during the application of each of said power pulses respectively, and means responsive to the magnitude of said process parameter error signal for controlling the time duration portion of each of said power pulses which energizes said selected actuator input as said actuator repositions said valve incrementally to reduce said process parameter error signal towards zero, said last-named means including means for adjusting the rate of movement of said actuator so that, as said process parameter error signal reduces toward zero, the movement of said actuator substantially matches the time constant of the process being controlled.

4,417,313
METHOD FOR OPTIMIZING THE DESIGN OF A FINITE NOISE BARRIER

Herman Medwin, 4021 Sunridge Rd., Pebble Beach, Calif. 93953

Filed May 18, 1981, Ser. No. 264,483
Int. Cl.³ G06F *15/31*
U.S. Cl. 364—524 **2 Claims**



1. A method for calculating the optimum response for design of a finite noise barrier comprising the steps of:

(a) defining the proposed edge sections of said finite noise barrier;

(b) calculating the times required for a pulse signal to go from a source to each of said proposed edge sections to a receiver loacted behind said barrier;

(c) identifying the diffracted contribution of each of said edge segments upon said pulse signal by the closed-form impulse solution of Biot-Tolstoy;

(d) determining the mathmatical time series of said diffracted contribution for each of said proposed edge segments as received by said receiver, said time series formulated by taking the Fourier transform of said Biot-Tolstoy solution and a digital transform of the remainder of said Fourier transform and sampling said diffracted contribution a plurality of times according to said time series;

(e) adding said mathmatical time series at equivalent times by superposition to obtain the diffracted impulse response received by said receiver for each of said proposed edge segments;

(f) calculating the impulse response integral for each of said added time series for each of said proposed edge segments;

(g) comparing said impulse response integrals to determine which of said proposed edge segements should be changed to obtain equal diffraction contributions by each of said proposed edge segments;

(h) using a digital computer to iteratively repeat the calculations of said impulse response integrals after changing said proposed edge segments until all of said impulse response integrals are equal;

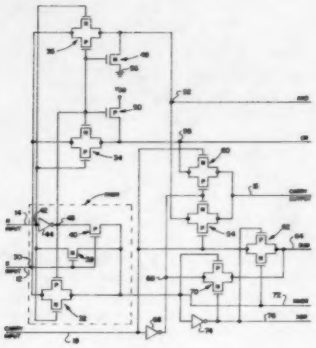
(i) computing the total impulse response integral of all of said added time series to find the total diffracted impulse response received by said receiver for all of said proposed edge segments; and

(j) transforming by digital Fourier techniques said total diffracted impulse response to obtain the desired frequency response of said barrier.

4,417,314
PARALLEL OPERATING MODE ARITHMETIC LOGIC UNIT APPARATUS

David W. Best, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 14, 1981, Ser. No. 283,263
Int. Cl.³ G06F *7/50*
U.S. Cl. 364—716 **11 Claims**



1. Arithmetic logic unit apparatus comprising, in combination:

first signal input means;

second signal input means;

carry signal input means;

AND, OR and Exclusive NOR (XNOR) gate means, connected to said first and second signal input means, for receiving first and second signals and providing parallel output AND, OR and XNOR signals responsive to said first and second signals;

ripple carry means, connected to receive AND, OR and carry signals from said AND gate means, said OR gate means and said carry signal input means respectively, for controlling passage of AND and OR signals therethrough in response to the logic value of carry input control signals, said ripple carry means providing carry output signals;

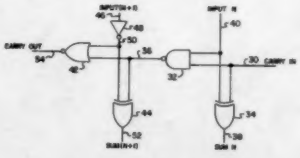
summing means, connected to said XNOR gate means and said carry signal input means, for receiving carry and XNOR signals whereby SUM output signal are provided in the form of carry and carry signals selectively passed by the logic value of said XNOR signals; and

means, connected to said XNOR means, for providing XOR output signals.

4,417,315
METHOD AND APPARATUS FOR INCREMENTING A DIGITAL WORD

Jeffrey D. Russell, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 14, 1981, Ser. No. 283,305
Int. Cl.³ G06F *7/50*
U.S. Cl. 364—770 **9 Claims**



1. Logic apparatus comprising, in combination:

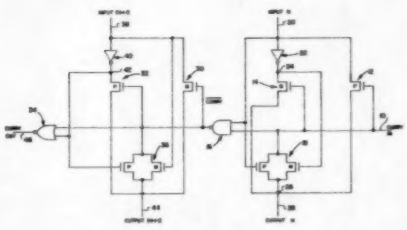
carry input means for providing a carry input signal;
input means for providing N stage input signals and (N+1) stage input signals;
NAND gate means and first exclusive OR gate means, each including output means, connected to said carry input signal means and to said input means for receiving carry input signals and N stage input signals respectively;
N stage SUM output means connected to said output of said first exclusive OR gate means for providing N stage SUM output signals;
inverter means connected to said input signals means for receiving said (N+1) stage input signals and providing a logically inverted output therefrom at output means thereof;
NOR gate means connected to said NAND means and to said inverter means for logically NORing the inputs and providing a carry output signal at an output means thereof; and
second exclusive OR gate means connected to said inverter means and to said output of said NAND means for logically exclusively combining said inputs to provide an (N+1) stage SUM output signal.

4,417,316

DIGITAL BINARY INCREMENT CIRCUIT APPARATUS

David W. Best, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 14, 1981, Ser. No. 283,267
Int. Cl.³ G06F *7/50*
U.S. Cl. 364—770 **3 Claims**



1. A ripple carry incrementer circuit comprising, in combination:
first means for providing a carry input signal to said increment circuit;
second means for inputting N bit position data bit signals;
NAND gate means including first and second input means and output means;
first inverter means including input and output means;
first, second and third gating means each including control means, input means and output means;
third means for providing N bit position data bit output signals;
fourth means for connecting said signal supplied by said first means to said control means of each of said first and second gating means and to said first input means of said NAND gate means as well as to said input means of said third gating means;
fifth means for connecting said second means to said input means of said first inverter means, to said second input means of said NAND gate means, said control means of said third gating means and to said input means of said first gating means for application of signals therethrough;
sixth means for connecting said output means of said inverter means to said control means of said third gating means and to said input means of said second gating means;
seventh means connecting said output means of each of said first, second and third gating means to said third means for supplying signals thereto as passed by said gating means;
fourth, fifth and sixth gating means each including input means, and output means and control means;
eighth means for inputting (N+1) bit position data bit signals;
ninth means for outputting (N+1) bit position data bit signals;
NOR gate means including first and second input means and carry output means;
second inverter means including input and output means;
tenth means connecting said output of said NAND gate means to said control means of each of said fourth and fifth gating means as well as to said first input means of said NOR gate means and to said input means of said sixth gating means for supplying signals thereto;
eleventh means connecting said eighth means to said input means of said second inverter means, said control means of said sixth gating means and said input means of said fourth gating means for supplying signals thereto;
twelfth means connecting said output means of said second inverter means to said second input means of said NOR gate means, said control means of said sixth gating means and to said input means of said fifth gating means; and
thirteenth means connecting said output means of each of said fourth, fifth and sixth gating means to said ninth means for outputting (N+1) bit position signals.

4,417,317

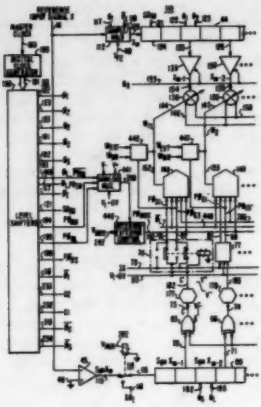
ADAPTIVE ANALOG PROCESSOR

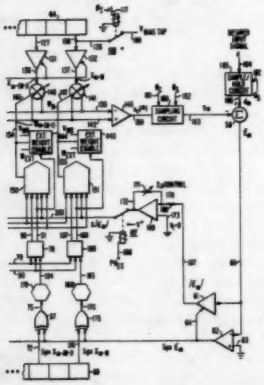
Marvin H. White, Columbia, and Ingham A. G. Mack, Laurel, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 118,052, Feb. 4, 1980, abandoned. This application Mar. 5, 1982, Ser. No. 355,075
Int. Cl.³ H04B *3/04*; H03H *21/00*; G11C *11/40*
U.S. Cl. 364—825 **7 Claims**

1. Apparatus for processing a first analog input signal represented by a plurality of time spaced discrete analog data signals each having a single value comprising:
first means for storing a predetermined number of said successive discrete analog data signals including a charge coupled device shift register, selected ones of said analog data signals being available at taps;
second means for detecting and storing the polarity of said successive discrete analog data signals;
third means including a plurality of capacitors each for storing charge indicative of the weight assigned to a respective tap;
fourth means for multiplying each of said successive discrete analog data signals available at a tap by the weight assigned thereto to form a plurality of products, said fourth means for multiplying including a plurality of field effect transistors, each having its gate coupled to one side of one of said plurality of capacitors and its drain coupled to said respective tap;
said fourth means for multiplying further including fifth means for compensating direct current off-sets in said fourth means for multiplying, arising from temperature drift in circuit components causing changes in threshold voltages of field effect transistors, changes in junction leakage currents and from long term drift in said first analog input signal said fifth means for compensating including means for injecting an external voltage at a selected tap of said charge coupled device shift register;
sixth means for summing said products together to provide a sum signal;
a second analog input signal represented by a plurality of time spaced discrete analog data signals each having a single value;
seventh means for subtracting said sum signal from said second analog input signal to form a difference signal; and
eighth means for incrementing the value of each stored weight as a function of the magnitude and polarity of said

difference signal and the polarity of said successive discrete analog data signals including ninth means for modifying said charge on each said respective capacitor in response to the polarity of said first analog input signal at





said tap and the polarity of said difference signal and including tenth means for determining the magnitude of the change of said charge as a function of the absolute magnitude of said difference signal.

4,417,318

ARRANGEMENT FOR CONTROL OF THE OPERATION OF A RANDOM ACCESS MEMORY IN A DATA PROCESSING SYSTEM

Shigeru Hirahata; Teruhiro Takezawa, both of Yokohama; Nobuo Onuki, Ebina; Shigeru Komatsu, and Tsuguji Tachiuchi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 2, 1979, Ser. No. 35,237

Claims priority, application Japan, May 4, 1978, 53-53491

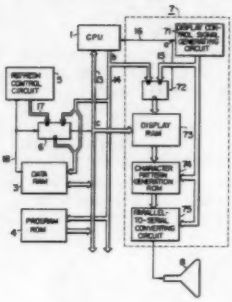
Int. Cl.³ G06F *3/00*; G11C *11/34*

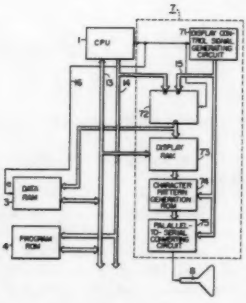
U.S. Cl. 364—900 **8 Claims**

1. In a data processing system including a first memory to be refreshed; a second memory for storing data to be successively read out during first periodic cycles; and a central processing unit for effecting transfer of data to and from said first and second memories during second periodic cycles which alternate with said first periodic cycles; the improvement comprising

display control address generating means for producing addresses sequentially during said first periodic cycles to periodically read out the contents of said second memory;

address selecting means which alternately and exclusively selects an address derived from said central processing unit or an address derived from said display control address generating means during said first and second periodic cycles and supplies the selected address in common to said first and second memories whereby, when said address selecting means selects an address from said central processing unit, said central processing unit executes a data transfer to one of said first and second memories, and when said address selecting means selects the address from display control address generating means, said first memory is refreshed and said second memory reads out stored data; and



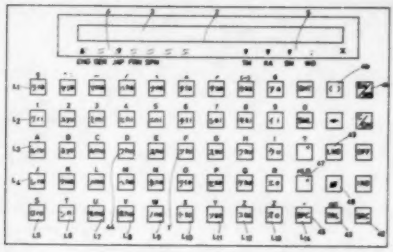


control signal generating means responsive to said display control address generating means generating an address for producing a control signal to cause said address selecting means to perform said selection operation in synchronism with the address generation of said display control address generating means.

4,417,319
ELECTRONIC TRANSLATOR FOR PROVIDING ADDITIONAL SENTENCES FORMED BY DIRECTLY-TRANSLATED WORDS

Masafumi Morimoto, Yamatokoriyama; Kunio Yoshida, and Tosaku Nakanishi, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 8, 1981, Ser. No. 252,144
Claims priority, application Japan, Apr. 15, 1980, 55-51062
Int. Cl.³ G06F 15/38
U.S. Cl. 364—900 4 Claims



1. An electronic translator wherein a plurality of first words represented in a first language are entered to obtain a plurality of second words represented in a second language equivalent to the first words, comprising:

input means for entering the first words;

memory means for storing the second words;

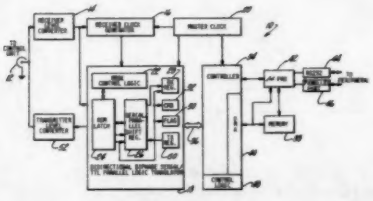
access means operatively connected to and responsive to said input means for addressing said memory means for retrieving the second words and for providing the second words in an order which is identical to the order of the input first words; and

indicating means responsive to said access means for indicating that the order of the second words is identical to the order of the first words.

4,417,320
INTERFACE FOR DATA COMMUNICATION SYSTEMS USING SERIAL BIPHASE DATA TRANSMISSIONS

David D. Ei, Ann Arbor, Mich., assignor to Interface Systems, Inc., Ann Arbor, Mich.

Filed May 11, 1981, Ser. No. 262,722
Int. Cl.³ G06F 3/04
U.S. Cl. 364—900 20 Claims



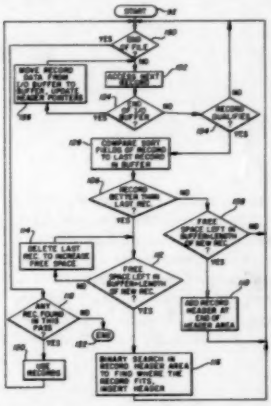
1. An interface for data communication systems using serial biphase transmissions between a central control unit and a peripheral device, each transmission including a predefined header sequence followed by one or more data words in which each logical bit is defined by half bits of different voltage levels, said interface comprising:

bi-directional translator means for translating serial biphase transmission from the control unit to TTL compatible parallel data used to control the operation of the peripheral device, said translator including means for detecting the voltage levels of each half bit of the biphase transmission, and sequencer means for generating an output as a function of current detected voltage levels and previously detected levels of the biphase transmission, said translator being further operative to translate TTL compatible parallel data from the peripheral device into biphase serial data for transmission to the control unit.

4,417,321
QUALIFYING AND SORTING FILE RECORD DATA

Philip Y. Chang, and Virginia M. Hoffman, both of Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 18, 1981, Ser. No. 264,959
Int. Cl.³ G06F 7/24
U.S. Cl. 364—900 9 Claims



1. A method of presorting file records in a storage means for temporary retention in a sort buffer in an order based on selected ranking, comprising the steps of:

(a) accessing each of said file records in said storage means;

(b) determining whether an accessed file record qualifies for transfer to the sort buffer;

(c) if said accessed file record qualifies, setting a record identifying bit from a first state to a second state;

(d) comparing the rank of the qualified file record data in the storage means with the rank of the lowest ranked file record in the sort buffer;

(e) if the rank of the qualified file record is higher than the rank of the lowest ranked file record, transferring the qualified file record in the storage means to unused space in the sort buffer;

(f) locating the qualified file record transferred to the sort buffer at a level based on said rank thereof; and

(g) resetting the record identifying bit to the first state for the qualified file record now located in the sort buffer.

4,417,322
REPORT GENERATION CONTROL SYSTEM FOR TEXT PROCESSING MACHINES

Richard E. Berry, Georgetown, and John H. Wilson, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1981, Ser. No. 273,561
Int. Cl.³ G06F 3/12
U.S. Cl. 364—900 9 Claims

1. A report generation control system for generating output reports containing inter-report summary data on a processor driven text processing system comprising:

a processor and memory;

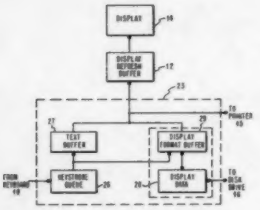
Input means connected to said processor including,

means for entering into the system an example report in the desired format including examples of fixed field text data and variable field file data,

means for editing the example report for replacing said variable field file data with file data control instructions,

means for editing said example report for inserting report summary instructions;

means responsive to said input means for displaying the edited example report as a replica of the desired output report;



and

processor control means stored in said memory including,

means for scanning the edited example report for file data control instructions and report summary instructions, and

means responsive to said means for scanning for executing said file data control instructions and said report summary instructions and merging said fixed field text data and the results from executing said file data control instructions and said report summary instructions into an output report.

4,417,323

BUBBLE MEMORY CONDUCTOR PATTERN WITH HEAT SINK

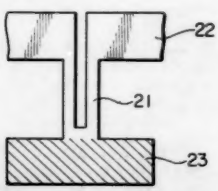
Atsushi Asano, Tokyo; Masatoshi Takeshita, Hachioji; Hideki Nishida, Hinodemachi; Ryo Suzuki, Kokubunji, and Toshio Futami, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 959,505, Nov. 13, 1978. This application Feb. 17, 1981, Ser. No. 234,630

Claims priority, application Japan, Nov. 11, 1977, 52-134667

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—1 **18 Claims**



1. In a magnetic bubble memory device having a storage film capable of storing a magnetic bubble, an insulating film, a conductor pattern, and a transfer pattern successively provided on a non-magnetic substrate, the improvement comprising means for dissipating heat from said conductor pattern and including a heat discharge pattern formed of a thermally conductive substance thermally coupled with a fine line portion of said conductor pattern.

4,417,324

MAGNETO-OPTIC TRANSDUCER

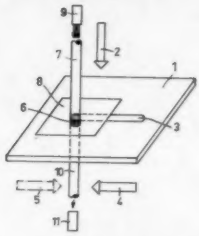
Bo B. Wikström, Malmö, Sweden, assignor to SAB Industri AB, Landskrona, Sweden

Filed May 5, 1981, Ser. No. 260,757

Claims priority, application Sweden, May 14, 1980, 8003639

Int. Cl.³ G11C *19/08, 13/06*

U.S. Cl. 365—10 **3 Claims**



1. A magneto-optic transducer, comprising in combination, a thin planar sheet of magnetic material, means for producing a first magnetic field substantially perpendicular to said sheet, generating magnetic bubbles therein, a pattern of thin magnetic film applied to the surface of said sheet and defining a guide path for the magnetic bubbles, means for producing a second magnetic field in the plane of said sheet for moving the magnetic bubbles along said guide path, means for optically sensing the presence of the magnetic bubbles at least at one location in said path, characterized in that said second magnetic field comprises a constant component field and a variable component field in opposite direction to said constant component field.

4,417,325

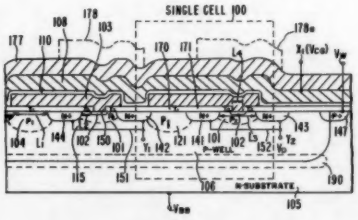
HIGHLY SCALEABLE DYNAMIC RAM CELL WITH SELF-SIGNAL AMPLIFICATION

Eliyahou Harari, 2320 Friars La., Los Altos, Calif. 94022

Filed Jul. 13, 1981, Ser. No. 282,882

Int. Cl.³ G11C *11/40;* **H01L** *29/80, 29/78;* **B05D** *5/12*

U.S. Cl. 365—185 **24 Claims**



1. A memory cell comprising:

a substrate of a first conductivity type;

a first region of second conductivity type formed on said substrate, said second conductivity type being opposite to said first conductivity type;

second, third, and fourth regions of said first conductivity type formed in said first region of said second conductivity type, said second and third regions being separated by a first portion of said first region and said third and fourth regions being separated by a second portion of said first region;

a fifth region of said first conductivity type formed in said second portion of said first region;

a first electrode attached to said fifth region said first electrode

being electrically isolated from said second, third, and fourth regions, said first electrode extending on insulation over said first portion to said second region and also extending over said third region and a part of said second portion, said first electrode being covered by second insulation; and

a word line formed over said second insulation so as to overlie said first electrode; said first electrode and said word line forming a dual electrode, said dual electrode structure forming a read transistor with channel length measured by the extent of said first portion, a write transistor with channel length measured by the separation between said third region and said fifth region, and a storage junction formed between said fifth region and said first region.

4,417,326

STATIC SEMICONDUCTOR MEMORY DEVICE

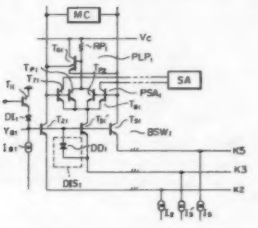
Kazuhiro Toyoda, Yokohama, and Yasuhisa Sugo, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 27, 1981, Ser. No. 325,381

Claims priority, application Japan, Nov. 28, 1980, 55-167472

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—190 **6 Claims**



1. A static semiconductor memory device, operatively connected to receive column selection signals, comprising:

a plurality of memory cells arranged in a matrix having columns and rows, each of said plurality of memory cells comprising two driving transistors connected in intersection;

a plurality of word lines connected to said plurality of memory cells and arranged in the row direction;

a plurality of bit lines connected to said plurality of memory cells and arranged in the column direction, each bit line connectable to receive a current for reading information stored in or for writing information to be stored in said plurality of memory cells;

a common current source;

a plurality of bit selection circuits operatively connected to said common current source and operatively connected to respective ones of said columns of said matrix, each of said plurality of bit selection circuits operatively connected to receive a corresponding one of said column selection signals having a first reference potential, when the corresponding column is selected, and to supply a current from said common current source to said corresponding selected column;

a plurality of bit driver circuits respectively, operatively connected to said columns of said matrix, each of said plurality of bit driver circuits connected to cause said column selection signal to have said first reference potential when the corresponding column is selected;

a discharge current source; and

means forming a plurality of discharge paths, each of said discharge paths being connected between a respective one of said plurality of bit selection circuits and said discharge current source, for functioning so that when a column in said matrix is switched from a selected state to a nonselected state, the potential of the corresponding column selection signal is changed to a second potential through said discharge path.

4,417,327

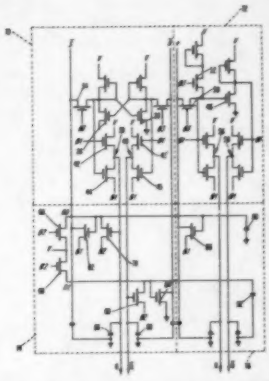
DYNAMICALLY OPERATED STRUCTURED LOGIC ARRAY

Kent F. Smith, 1775 Grover La., Salt Lake City, Utah 84117

Filed Sep. 9, 1980, Ser. No. 185,538

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—203 **29 Claims**



1. A structured logic array comprising a plurality of logical columns, each having at least one column input conductor and at least one column output conductor, and a plurality of row conductors disposed orthogonal to said column conductors, said logic array including:

means for generating at least two phase-displaced clocking signals;

a storage cell operatively associated with one of said logical columns and having a memory element, means for precharging the output conductor of the associated column to a predetermined value during a first one of said clocking signals and for causing said output conductor to assume a binary state determined by information stored in the memory element upon the termination of said first clocking signal, and means responsive to a second one of said clocking signals for opertively transmitting the information on the column input conductor to said memory element; and

a logic cell for interconnecting the logical columns and the row conductors and having means for precharging the row conductors during the first clocking signal, means for controlling the binary state of a row conductor upon termination of said first clocking signal, and means for transmitting the binary state of the row conductor to at least one column input conductor.

4,417,328

RANDOM ACCESS SEMICONDUCTOR MEMORY DEVICE USING MOS TRANSISTORS

Kiyofumi Ochii, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 30, 1981, Ser. No. 230,000

Claims priority, application Japan, Jan. 31, 1980, 55-10259; May 26, 1980, 55-69943

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—203 **4 Claims**

1. A semiconductor memory device for outputting data in response to a state transition of an address signal supplied to the device, the device comprising:

a plurality of memory cells arranged in columns and rows;

a plurality of dummy memory cells arranged in a column;

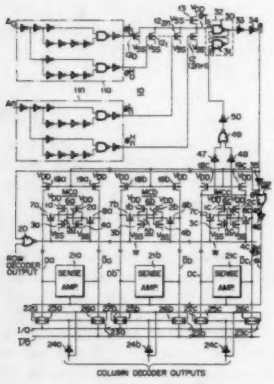
a plurality of pairs of data lines, each of said pairs being connected to said memory cells arranged in a column, one of each of said pairs of data lines being discharged in response to data read out from one of said memory cells arranged in a column;

a dummy data line having substantially the same load capacitance as that of each of said data lines and being connected to said dummy memory cells, said dummy data line being discharged in response to the accessing of one of said dummy memory cells;

precharging means connected to said data lines and said dummy data line for precharging said data lines and said dummy data line prior to the read out of data from said memory cells and to the accessing of said dummy memory cells;

a plurality of first sense amplifiers, each of said first sense amplifiers being connected to a different one of said pairs of data lines and for discharging one of said data lines coupled thereto responsive to the read out of data from one of said memory cells connected to said one data line to amplify the data read out of the memory cell;

a second sense amplifier connected to said dummy data lines, said second sense amplifier for discharging said dummy data line responsive to the accessing of one of said dummy memory cells;



precharge detect circuit means connected to said dummy data line for detecting a precharging state of said dummy data line;

address signal state transition detector means for receiving the address signal and for detecting a state transition of said address signal; and

control circuit means connected to said state transition detector means and said precharge detect circuit means, said control circuit means for changing from a first state to a second state in response to a state transition of said address signal to cause said precharging means to precharge said data lines and said dummy data line, and to change state from said second state to said first state in response to the precharging of said dummy data line to a predetermined voltage level to disable said precharging means from precharging said data lines and said dummy data line.

2. A semiconductor memory device for outputting data in response to a state transition of an address signal supplied to the device, the device comprising:

a plurality of memory cells arranged in columns and rows;

a plurality of pairs of data lines, each of said pairs of data lines being connected to said memory cells arranged in a different one of said columns, one of each of said pairs of data lines being discharged in response to the read out of data from one of said memory cells arranged in a column;

precharging means connected to said data lines for precharging said data lines prior to the read out of data from said memory cells;

a plurality of first sense amplifiers, each of said first sense amplifiers being connected to a different one of said pairs of data lines to discharge said data line connected thereto responsive to the read out of data from one of said memory cells connected to said data line to amplify the data read out of said one memory cell;

precharge detect circuit means connected to a predetermined pair of said plurality of pairs of data lines for detecting a precharging state of said predetermined pair of data lines;

address signal state transition detector means for receiving the address signal and for detecting a state transition of said address signal; and

control circuit means connected to said state transition detector means and said precharge detect circuit means, said control circuit means for changing from a first state to a second state in response to a state transition of said address signal to cause said precharging means to precharge said data lines, and to change from said second state to said first state in response to the precharging of said predetermined pair of data lines to a predetermined voltage level to disable said precharging means from precharging said data lines.

4,417,329

ACTIVE PULL-UP CIRCUIT

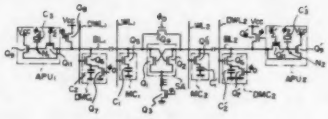
Tsutomu Mezawa, Aizuwakamatsu; Katsuhiko Kabashima; Shigeki Nozaki, both of Kawasaki, and Yoshihiro Takemae, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 27, 1981, Ser. No. 287,104

Claims priority, application Japan, Jul. 29, 1980, 55-104123

Int. Cl.[3] **G11C** *7/00;* **H03K** *5/05, 17/693*

U.S. Cl. 365—203 **10 Claims**



1. An active pull-up circuit having a stand-by mode and a pull-up mode, comprising:

first and second power supplies, the potential of said first power supply being higher than that of said second power supply;

an output line;

first means for generating a first clock signal having a potential which is of a second potential level during the stand-by mode, and which is of a first potential level, higher than said second potential level, during the pull-up mode;

second means for generating a second clock signal having a potential which is of a third potential level during the stand-by mode, and which is of a fourth potential level, lower than said third potential level, during the pull-up mode;

means, connected to said first power supply and said output line, for pulling-up the potential of said output line;

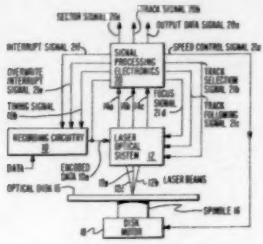
means, connected to said first means and said pulling-up means, for supplying said first clock signal to said pulling-up means; and

a depletion type MIS transistor having a drain connected to said pulling-up means and said first clock signal supplying means, having a source connected to said output line and a gate connected to said second means.

4,417,330
OPTICAL MEMORY SYSTEM PROVIDING IMPROVED FOCUSING CONTROL

Robert L. Hazel, Thousand Oaks, and Edward V. LaBudde, Newbury Park, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 15, 1981, Ser. No. 311,630
Int. Cl.³ G11B 7/00
U.S. Cl. 369—32 8 Claims



1. In an optical data system, the combination comprising:

an optical recording medium having at least one track containing a plurality of spaced header recordings disposed along the track, each header recording including a plurality of focusing optical holes arranged in a predetermined pattern;

reading means including an optical reading radiation beam for reading optical holes in a track of said recording medium, said reading beam having an intensity such that the beam will not disturb the integrity of recorded optical holes;

means providing for relative movement of said beam along a track; and

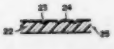
focusing means for controlling the focusing of said beam on said medium;

said reading means including control means responsive to the reflected reading beam obtained when the reading beam traverses said focusing optical holes for deriving a focusing control signal which is applied to said focusing means for maintaining the beam in focus on said medium.

4,417,331
METHOD FOR MANUFACTURING AN OPTICAL DISC

Takashi Takaoka; Masahiko Mochizuki; Mitsuo Yamashita, and Tadao Miura, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 17, 1981, Ser. No. 235,427
Claims priority, application Japan, Feb. 18, 1980, 55-18698
Int. Cl.³ G11B 7/00
U.S. Cl. 369—111 2 Claims



1. A method for manufacturing an optical recording disk having an optical recording layer in which information is written by irradiating a focussed laser beam modulated by the information, said method comprising the steps of:

(a) plastically deforming a surface of an original disk to form a spiral recessed track having a width of 0.2 to 0.41 μm;

(b) coating a metal layer on the original disk plastically deformed according to step (a);

(c) separating the metal layer from the original disk to provide a relief mold;

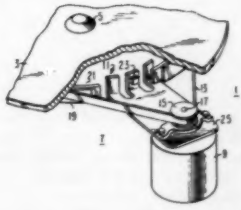
(d) forming a substrate having a recessed track by using the relief mold formed according to step (c) as a second original disk; and

(e) coating an optical recording layer on the surface of the substrate.

4,417,332
TURNTABLE SPEED CONTROL

Kevin C. Kelleher, Plainfield, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 15, 1981, Ser. No. 273,728
Int. Cl.³ G11B 25/04
U.S. Cl. 369—266 4 Claims



1. A turntable drive system comprising:

a turntable for rotating a disc-shaped record

a DC motor for rotating said turntable;

a drive belt coupling said DC motor to said turntable;

means for controlling the rotational speed of said turntable comprising:

an annular member coaxially mounted on said turntable having a plurality of permanently magnetized poles of alternate polarity along the periphery thereof;

a Hall effect device for sensing the rotary motion of said annular member and providing a signal indication of the rotational speed of said turntable;

a motor mounting bracket providing a support for said Hall effect device and concentrating the magnetic flux from said annular member such that a component of the magnetic field from said annular member passes through the active area of said Hall effect device; and

means responsive to said speed indication signal for controlling the level of drive to said DC motor;

wherein said magnetized poles of alternate polarity along the periphery of said annular member are evenly spaced therearound and wherein said supporting means includes a plurality of projections, positioned adjacent said annular member, being spaced at a distance equal to the spacing between adjacent poles on said annular member, said projections concentrating said magnetic flux; and

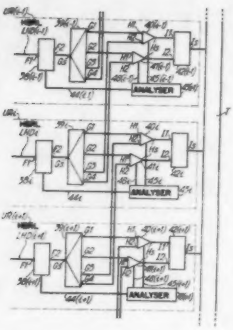
wherein said plurality of projections is equal to three and wherein said Hall effect device is positioned on one of said three projections.

4,417,333

SYSTEM TO INTERCONNECT SUBSCRIBER LINES TO A TELEPHONE AUTOMATIC TIME DIVISION SWITCH

Jean-Yves Cochennec, Rue de Kernevez, F-22560 Trebeurden, France

Filed Nov. 12, 1981, Ser. No. 320,191
Claims priority, application France, Nov. 28, 1980, 80 26030
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—66 **2 Claims**



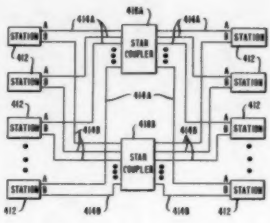
1. A system provided for the interconnection telephone subscriber lines to an automatic telephone time division switch having, on the subscriber side, interconnection apparatus and, on the automatic switch side, interconnection units, which are connected in pairs to high bit rate links, each interconnection apparatus being associated with the 112 lines of a cable and having for each single subscriber line, an individual subscriber equipment which is comprised of means to fulfill the conventional line interface functions and in addition, a conventional 2-wire/4-wire differential coupler whose 4-wire output is connected to an analog-digital and digital-analog converter whose digital output is connected to an outgoing multiplex and whose digital input is connected to an entering multiplex, together forming a PCM multiplex, each individual subscriber equipment respectively having in the said PCM multiplex an allocated outgoing channel and an allocated return channel, a PCM multiplex thus serving sixteen individual subscriber equipments, in which seven PCM are provided to serve the 112 lines of a cable, characterized in that the high bit rate links have a capacity at least double that of the hook-up apparatus HAi and in that the hook-up apparatus HAi is comprised of a first multiplexor (**30*i***) and a second multiplexor (**31*i***) to which are connected, on one side, the seven PCM, and a first high bit rate link (HBRL'i or HBRL''i), on the other side, a third multiplexor (**32*i***) to which is connected, on one side, the first high bit rate link HBRL'i of the first multiplexor (**30*i***) and a second high bit rate link (ENTR(i−1)) provided from the neighboring interconnection apparatus HA(i−1) of immediate lower order, and, on the other side a third high bit rate link (cs−D1) which is connected to one terminal of a transmitter-receiver apparatus (**33*i***) whose other terminal is connected to a high bit rate link (HBRLi), a coupler (**34*i***) of which one terminal is connected to the high bit rate link (HBRL''i) of the second multiplexor and the other terminal by a second high bit rate link (ENTi) to a third multiplexor (**32**($i+1$)) of the neighboring hook-up apparatus (HA(i+1)) of immediate higher rank.

4,417,334

DATA PROCESSING SYSTEM HAVING DUAL-CHANNEL SYSTEM BUS

Robert O. Gunderson, Poway; James E. Kocol, and David B. Schuck, both of Escondido, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Division of Ser. No. 254,850, Apr. 16, 1981. This application Apr. 16, 1981, Ser. No. 254,792
Int. Cl.³ H04J *6/00*
U.S. Cl. 370—85 **17 Claims**



1. A data processing system, comprising:

a plurality of stations, wherein each station includes at least one data processor and a memory storing data for said processor;

a first star coupler;

a second star coupler; and

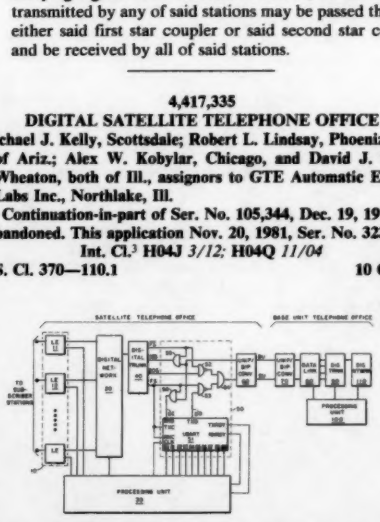
first and second pairs of transmission lines associated with each station, said first pair of transmission lines connected between its associated station and said first star coupler, said second pair of transmission lines connected between its associated station and said second star coupler, with each of said first and second pairs of transmission lines including a first transmission line for carrying signals from its associated station and a second transmission line for carrying signals to its associated station, so that signals transmitted by any of said stations may be passed through either said first star coupler or said second star coupler and be received by all of said stations.

4,417,335

DIGITAL SATELLITE TELEPHONE OFFICE

Michael J. Kelly, Scottsdale; Robert L. Lindsay, Phoeniz, both of Ariz.; Alex W. Kobylar, Chicago, and David J. Stelte, Wheaton, both of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Continuation-in-part of Ser. No. 105,344, Dec. 19, 1979, abandoned. This application Nov. 20, 1981, Ser. No. 323,345
Int. Cl.³ H04J *3/12*; H04Q *11/04*
U.S. Cl. 370—110.1 **10 Claims**



1. A satellite digital telephone system including a satellite digital telephone office, said office including a plurality of line circuits, a first digital network operated to generate a first plurality of parallel date groups, and a first processing unit operated to generate digital data respresentative of the status

and identity of said line circuits, said satellite telephone system comprising:

a first digital trunk connected to said first digital network operated in response to said first parallel data groups to periodically generate alternately occurring first and second serial data streams, each comprising said first plurality of parallel data groups, said digital trunk further operated to generate a first terminal framing bit and concatenate said first terminal framing bit to each of said first plurality of data streams;

first data link means connected to said processing unit and to said digital trunk, operated in response to said digital data from said processing unit to concatenate each successive one said second plurality of data streams; and

first polarity conversion means connected to said first data link means operated in response to said first and second pluralities of data streams to generate bipolar signals representative of said first and second pluralities of data streams.

4,417,336

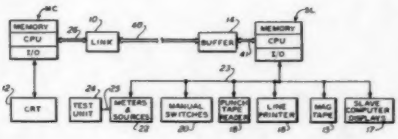
METHOD OF TESTING WITH COMPUTERS

Thomas O. Weilbacker, Northvale, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Jun. 18, 1981, Ser. No. 274,952

Int. Cl.³ G01R *31/28*

U.S. Cl. 371—20 **12 Claims**



1. A method of testing a unit with a test instrument and with the aid of a master, an intermediate and a slave computer, the latter being connected to said test instrument for sensing its measurements, comprising the steps of:

dispatching one of a plurality of instruction signals to said intermediate computer from said master computer;

issuing to said slave computer, when it is not halted, a signal to halt from said intermediate computer after receipt by the latter of one of said instruction signals, said signal to halt being provided in response to one of said instruction signals;

transmitting from said intermediate to said slave computer, after the latter has halted, that one of a plurality of command signals corresponding to the currently received one of said instruction signals;

altering the state of said slave computer in response to that one of said command signals transmitted from said intermediate computer, the altering of the state of said slave computer being directed by said master computer without any change in direction originating from said intermediate computer;

forwarding a go signal to said intermediate computer from said master computer;

issuing to said slave computer from said intermediate computer a run signal signifying a request to run and sense measurements from said test instrument; and

performing successive measurements with said slave computer without successive authorization through said intermediate computer.

4,417,337

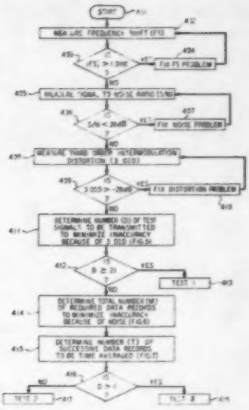
ADAPTIVE MULTITONE TRANSMISSION PARAMETER TEST ARRANGEMENT

David L. Favin; Peter F. Lynn, both of Little Silver, and Paul J. Snyder, Linden, all of N.J., assignors to Bell Telephone Laboratories, Incorporated,, Murray Hill, N.J.

Filed Jun. 29, 1981, Ser. No. 278,884

Int. Cl.³ H04B *3/46*

U.S. Cl. 371—22 **13 Claims**



1. A method for generating a measurement of at least one prescribed transmission parameter of a network or facility under evaluation, comprising the steps of,

generating measurements of prescribed impairments on the network or facility under evaluation,

utilizing said impairment measurements in accordance with predetermined relationships to dynamically determine test parameters including a number of test signals in a set of test signals to be generated, a required total number of measurements, a maximum number of consecutive measurements in each set of consecutive measurements to be time-averaged, and a number of time-averaged sets of measurements in an ensemble to be obtained,

generating said set of test signals, each test signal having a plurality of tones, and each tone having predetermined amplitude, frequency and unique phase component values determined in accordance with a prescribed criterion,

transmitting said set of test signals over said network or facility under evaluation,

making said number of sets of consecutive measurements of a received version of each test signal in said set of test signals,

time averaging the measurements in each individual set of said sets of measurements,

obtaining said ensemble of said time-averaged sets of measurements, and

utilizing said ensemble to generate the measurement of the at least one prescribed transmission parameter.

4,417,338

CRYPTOGRAPHIC KEY SHARING CIRCUIT AND METHOD USING CODE CORRECTION

George I. Davida, Tucker, Ga., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Apr. 13, 1981, Ser. No. 253,563

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—37 **5 Claims**

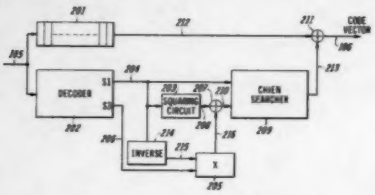
1. A method for generating a certain number of secondary keys and for using some of said secondary keys in cooperation

with a corrupted code vector to reconstruct a code vector having a length of N digits, comprising the steps of:

choosing a certain number, n, of secondary keys to be distributed to n individuals;

assigning a subset of digit positions comprising e of said N digit positions of said code vector to each of said secondary keys in a random manner such that the total number of such digit positions assigned is equal to a certain number $T=n\times e$;

calculating a corrupted code vector by creating errors in each of said T digit positions of said code vector assigned to said secondary keys and in e' randomly chosen digit positions;



choosing an error correcting code system comprising a set of code vectors, and a procedure for correcting code vectors which have been corrupted by errors, into the corresponding code vectors provided that there have been no more than $t=(n-k)e+e'$ errors in the digits of an N digit code vector; and

reconstructing said code vector by using any k of said n secondary keys to correct the errors in $k\times e$ of said N digit positions of said N digit corrupted code vector followed by using said error correcting code system to correct the remaining errors in no more than t digit positions.

4,417,339

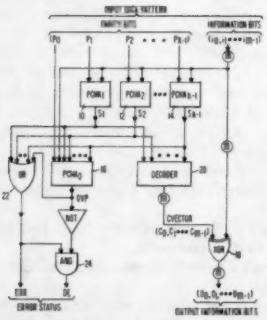
FAULT TOLERANT ERROR CORRECTION CIRCUIT

Robert G. Cantarella, Paoli, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 22, 1981, Ser. No. 275,563

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—37 **28 Claims**



1. A fault tolerant circuit for correcting and detecting errors in an inputted data pattern, said inputted data pattern encoded in a modified Hamming type code, said inputted data pattern including a set of m input information bits, $i_0, i_1, \ldots, i_{m-1}$, and a set of k parity bits, $p_0, p_1, \ldots, p_{k-1}$, where $m \cong k > 0$, said circuit capable of tolerating a failure of any one of a plurality of elements included in said circuit without corrupting the information bits of a correct inputted data pattern, said circuit comprising:

k−1 parity check means, each of said k−1 parity check means receiving a different one of k−1 subsets of the set of m input information bits and one of a first subset of the set of k parity bits, each of said k−1 parity check means for producing a syndrome bit corresponding to its received parity bit;

decoder means, receiving said produced syndrome bits, for decoding said produced syndrome bits into a correction vector;

exclusive ORing means, receiving said correction vector and said set of m input information bits, for producing a set of m output information bits; and

error status means, responsive to a second subset of said set of k parity bits, a second subset of the set of m information bits and said produced syndrome bits, for providing error status indications including an indication that the set of m output information bits is correct in response to said circuit receiving said correct inputted data pattern and the occurrence of said failure of any one of said plurality of elements.

4,417,340

METHOD FOR PRODUCING DISCHARGE IN GAS LASER AT LOW VOLTAGE

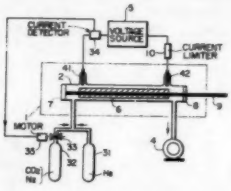
Naoya Horiuchi, Kawasaki; Takafumi Ohhara, Tokyo, and Reiji Sano, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Apr. 3, 1981, Ser. No. 251,968

Claims priority, application Japan, Apr. 4, 1980, 55-44884

Int. Cl.³ H01S *3/22*

U.S. Cl. 372—58 **8 Claims**



1. A method for ionizing a mixture of first and second constituent gases in a laser tube under the influence of an electric field, comprising the steps of:

introducing the first constituent gas having a first ionization voltage into said tube until a predetermined partial pressure is reached to cause said first constituent gas to ionize under the influence of said field;

detecting an occurrence of ionization of the first constituent gas in the laser tube, and, in response;

introducing the second constituent gas having a second ionization voltage higher than the first ionization voltage into said tube until a normal operating pressure of the mixture is reached to allow the second constituent gas to ionize.

4,417,341

GLASS LASER AMPLIFIER HAVING A NUMBER OF TRIGGER MEMBERS

Chiyoe Yamanaka, Ashiya; Yoshiaki Kato, Hirakata; Kunio Yoshida, Takatsuki, and Eiji Yoshida, Osaka, all of Japan, assignors to The President of Osaka University, Japan

Filed Sep. 24, 1980, Ser. No. 190,485

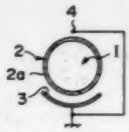
Claims priority, application Japan, Feb. 25, 1980, 55-022366

Int. Cl.³ H01S *3/093*

U.S. Cl. 372—72 **9 Claims**

1. A glass laser amplifier comprising a laser glass in which lasing occurs; a number of flash lamps for emitting light to pump said laser glass arranged around said laser glass; a number of reflection mirrors disposed facing said laser glass and oriented for reflecting light from each of said flash lamps against said laser glass; and a number of trigger members arranged adjacent said flash lamps at the opposite side as said

reflection mirrors with each of said flash lamps being held between said trigger members and said reflection mirrors so as



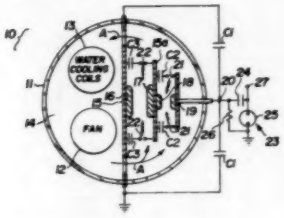
to eliminate deflection of electric current in each of said flash lamps caused by said reflection mirrors.

4,417,342

LASER

Terrence J. McKee, Nepean, Canada, assignor to Lumonics Inc., Kanata, Canada

Filed Mar. 3, 1981, Ser. No. 239,992
Int. Cl.³ H01S *3/097*
U.S. Cl. 372—87 **8 Claims**



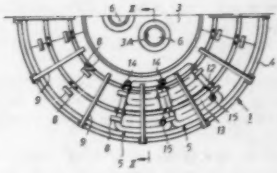
1. A gas laser comprising
(a) an envelope,
(b) a gaseous medium in said envelope capable of lasing action,
(c) optical reflectors defining a main optical resonant cavity which extends along said envelope,
(d) a main pair of spaced-apart electrodes located in said envelope on respective sides of said main cavity to define a main lasing region in said cavity between said electrodes,
(e) a subsidiary pair of spaced-apart electrodes located in said envelope to define a discharge gap to act as a voltage sharpening gap,
(f) means connecting said main pair of electrodes in series with said subsidiary pair of electrodes to define a series circuit,
(g) means for subjecting said main lasing region and said sharpening gap to preionization radiation,
(h) a firing circuit connected across said series circuit for providing a rising voltage pulse to said series circuit,
(i) an impedance element connected across each of the pairs of electrodes, whereby, upon an application of said rising voltage pulse across said series circuit, a portion of the voltage of said pulse appears across the subsidiary electrodes until the sharpening gap breaks down to act as a low inductance switch and rapidly increase the voltage across the main electrodes until the region between them breaks down to initiate lasing action, and
(j) further optical reflectors defining a second optical resonant cavity which extends along said envelope,
(k) said subsidiary pair of electrodes being located on respective sides of said second cavity to define a second lasing region in said second cavity between said subsidiary electrodes for lasing action when the sharpening gap therebetween breaks down.

4,417,343

WATER-COOLED LID MADE OF STEEL TUBING FOR ELECTRIC FURNACE

Seiji Yamamoto, Himeji, Japan, assignor to Nikko Co., Ltd., Hyogo, Japan

Filed Jun. 30, 1981, Ser. No. 279,083
Claims priority, application Japan, Oct. 1, 1980, 55-140711[U]; Oct. 1, 1980, 55-140712[U]
Int. Cl.³ F27D *1/12*
U.S. Cl. 373—73 **3 Claims**



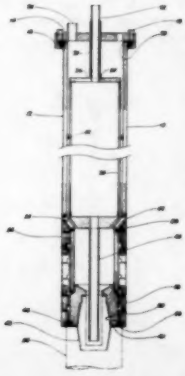
1. A water-cooled lid made of steel tubing for an electric furnace comprising divided sectorial segments, each of the sectorial segments having a cooling water inlet and a cooling water outlet and being formed in its interior with a zigzag cooling water channel for holding the inlet in communication with the outlet, the lid being characterized in that the cooling water channel is formed by bending a single, partition-free, steel tube of circular cross section into zigzag portions folded together in intimate contact with one another and into a peripheral portion surrounding the zigzag portions in the form of a sector in intimate contact therewith, the sectorial segment being grouted with a refractory between the adjoining outer peripheral portions of the steel tube at least on one side of the segment exposed to the interior of the furnace.

4,417,344

COMPOSITE ELECTRODE FOR ARC FURNACE

Grady R. Hogg, Jr., Elizabethton, and Nathan S. Tanner, Johnson City, both of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Aug. 3, 1982, Ser. No. 404,828
Int. Cl.³ H05B *7/101, 7/085*
U.S. Cl. 373—93 **7 Claims**



1. An electrode for an electric arc smelting furnace comprising an upper liquid cooled section, a hollow threaded connecting nipple, and a graphite lower section,
(a) said upper section comprising:
1. a cylindrical main outer structure formed from metal tubing;

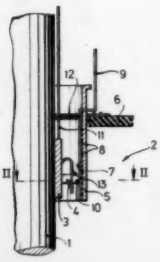
2. a head plate secured to the upper end of 1 having a cooling liquid inlet and outlet;
3. said inlet comprising tubing to be connected to an exterior liquid coolant supply and passing through said head plate, connected to a port in the top plate of a metal internal cylinder which is concentric with said main structure and separated therefrom by spacers;
4. said internal cylinder serving as a liquid reservoir, heat sink, and passageway for cooling liquid and occupying a majority of the internal volume of said main structure;
5. said main structure and said internal cylinder having a common lower end plate having a central cooling liquid port fitted with a outlet tube;
6. said lower outlet tube extending into the cavity of said nipple;
7. the periphery of said lower end plate being beveled;
8. cooling liquid passageways extending from top to bottom of said lower end plate approximately parallel to said bevel;
9. a cylindrical member comprising metal tubing defining a chamber depending from and having about the same diameter as the lower side of said lower end plate, and having attached thereto at its lower end a female socket for said nipple;
10. the socket and chamber areas being insulated by a series of superimposed exterior graphite rings having approximately the same interior diameter as the exterior of said socket and chamber and having about the same exterior diameter as said main structure, the top ring of said series being complementarily beveled to the beveled periphery of said lower end plate, each ring having a notch at its lower interior edge fitting a retaining ring attached to the exterior lower diameter of said socket;
11. said socket being hollow metal and having internal threads adapted to hold said correspondingly threaded nipple in place;
12. said inlet, internal cylinder, lower outlet tube, the annulus between said lower outlet tube and said nipple, said chamber, said passageways, the annulus between said main structure and said internal cylinder, and said outlets forming a continuous path for cooling liquid.

4,417,345

HOLDER FOR AN ELECTRODE

Harald Krogsrud, Gjettum, Norway, assignor to Elkem a/s, Oslo, Norway

Filed Jul. 9, 1981, Ser. No. 281,720
Claims priority, application Norway, Jul. 25, 1980, 802263
Int. Cl.³ H05B 7/10
U.S. Cl. 373—101 **7 Claims**



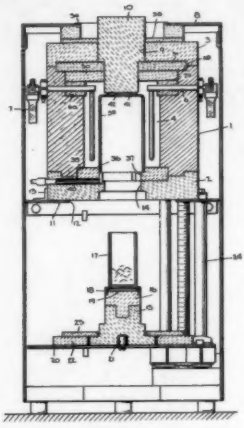
1. An electrode holder assembly for an electrode of an electrothermal smelting furnace comprising an external cooling shield operative also as a thrust member; a plurality of vertically-extending, current-conducting rails disposed on said cooling shield along an inner surface thereof; a plurality of contact clamps for clamping against an electrode; pressure producing means including a contact section slidable on said current-conducting rails; said pressure producing means being arranged between said contact clamps and said current conducting rails wherein said pressure producing means are operative to transfer current to said contact clamps by contact of said contact sections against said current-conducting rails.

4,417,346

HIGH TEMPERATURE MELTING FURNACE

Roger R. Giler, Wilton, Conn., assignor to The Kanthal Corporation, Bethel, Conn.

Filed Jun. 29, 1981, Ser. No. 278,053
Int. Cl.³ H05B 3/00; F27D 1/00
U.S. Cl. 373—137 **5 Claims**

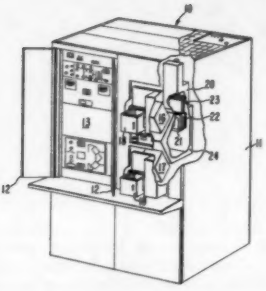


1. A high temperature melting furnace comprising a fibrous refractory vertical cylindrical shell, a fibrous refractory circular furnace top resting on the upper end of the shell, a plurality of molybdenum disilicide resistance wire loops depending inside the shell from right-angle molybdenum disilicide terminals which extend radially through the shell and hold the loops spaced from the inside of the shell, means for mounting the terminals on the shell so as to prevent concentrations of the terminals' weight on the shell, the furnace top having a vertical access hole provided with a fibrous refractory closure plug which is upwardly removable to permit access to the inside of the shell when the furnace is operating, a fibrous refractory furnace bottom on which the shell rests and the furnace bottom having a vertical charging hole provided with a refractory pedestal removably insertable in the charging hole and adapted to support a crucible for upward insertion into the furnace, the upper end of the shell being formed with internal recessed upper and lower annular shelves respectively of larger and smaller diameters and a small fibrous refractory disk resting on the smaller diameter shelf and a larger fibrous refractory disk resting on the larger diameter shelf and on top of the small disk, both of the disks being radially split with their respective slits circumferentially offset from each other and the disks having holes registered with the top's access hole and through which the access closure plug extends, the furnace top resting on the larger disk and the disks supporting the weight of the furnace top, said shell furnace bottom and furnace top being free from rigid horizontal and vertical restraint to thermal expansion and contraction and said split larger and smaller disks being free from rigid connection with each other and the shell, the outside of the shell having access to the ambient air and said fibrous refractory comprising interlocked refractory ceramic fibers.

4,417,347
SEMICONDUCTOR PROCESSOR INCORPORATING BLACKBODY RADIATION SOURCE WITH CONSTANT PLANAR ENERGY FLUX

Richard S. Muka, Topsfield, and Carl J. Russo, Ipswitch, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 12, 1981, Ser. No. 262,838
Int. Cl.³ H05B 6/42
U.S. Cl. 373—158 **8 Claims**

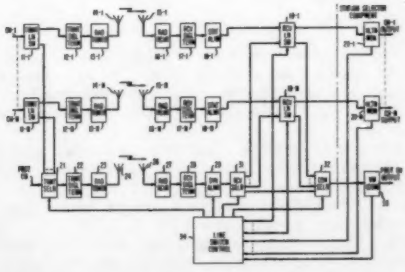


1. An apparatus for thermally processing a semiconductor material, comprising:
- a processing chamber;
- vacuum generation means for controlling the pressure in said processing chamber;
- means for introducing and removing said semiconductor material from said processing chamber;
- a platen mounted within said processing chamber for receiving said material upon introduction, holding said material during thermal treatment and delivering said material for removal; and
- a blackbody source having a constant planar energy flux characteristic, said source being positioned in opposition to said platen during said thermal treatment.

4,417,348
ERRORLESS LINE PROTECTION SWITCHER

Charles R. Abbruscato, San Jose, Calif., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 30, 1981, Ser. No. 259,007
Int. Cl.³ H04K 1/00
U.S. Cl. 375—40 **11 Claims**

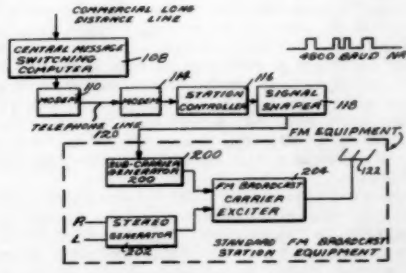


1. In a digital radio system, a line protection switching arrangement comprising:
- shifting means for adjusting the relative timing between digital signals of an impaired regular channel and of a spare channel when both channels are being provided the same digital signal for switching from the regular channel to the spare channel, the shifting means comprising first and second stages serially connected together, each stage independently responsive to separate control signals, one stage providing signal shifts in fine discrete increments fractionally related to a bit increment of the digital signals and the other stage providing signal shifts in full bit increments of the digital signals;
- detecting means connected to receive both digital signals and derived clocking signals via the shifting means for separately indicating channel signal alignment and clocking signal alignment;
- switching means, connected to receive both digital signals of the spare and the impaired channel via the shifting means, for providing a signal path from either to its output; and
- controlling means for adjusting the shifting means responsive to the indications of the detecting means, the controlling means first aligning the clocking signals by adjusting the shifting means in fine discrete increments to vary the timing of one of the digital signals and its derived clocking signal and then aligning the bits of the digital signals by adjusting the shifting means in bit increments for one of the digital signals, and the controlling means directing the switching means to change the signal path to its output from the regular channel to the spare channel after the controlling means obtains channel signal alignment, thereby providing error free channel substitution.

4,417,349
SCA DATA TRANSMISSION SYSTEM WITH A RAISED COSINE FILTER

Michael Hills, McLean, Va.; Clay Durret, Huntsville, Ala., and William Von Meister, McLean, Va., assignors to Digital Broadcasting Corporation, McLean, Va.

Filed Nov. 8, 1979, Ser. No. 92,463
Int. Cl.³ H04H 5/00; H04L 25/03
U.S. Cl. 375—60 **19 Claims**

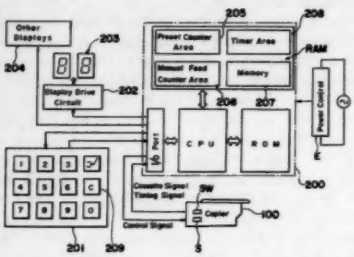


1. A method of transmitting data at a speed of at least about 4,800 bits per second comprising the steps of:
- generating digital data;
- containing the bandwidth of the transmitted data by converting said digital data to a bipolar line code format, said bipolar line code format including transitions in the absence of said generated digital data;
- shaping the converted digital data in the time domain to produce shaped digital data;
- frequency modulating a sub-carrier of a commercial broadcast channel with the shaped digital data to produce a modulated sub-carrier; and
- frequency modulating a carrier with the modulated sub-carrier.

4,417,350
COUNTER CONTROL IN ELECTROPHOTOGRAPHIC COPIER

Hideo Ito; Masazumi Ito, both of Toyokawa; Kenzo Nagata, Okazaki, and Yutaka Irie, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 23, 1981, Ser. No. 246,318
Claims priority, application Japan, Mar. 28, 1980, 55-40982
Int. Cl.³ G06M 3/06
U.S. Cl. 377—8 12 Claims



1. In an electrophotographic copying machine comprising a preset counter device and which is selectively operable in one of a multi-copy mode wherein a copying operation is repeated to produce a plurality of copies while copying papers which are to have an image affixed thereto are automatically fed one at a time and a manual feed mode wherein said copying operation is carried out by the use of copying papers which are to have an image affixed thereto and which are fed manually one at a time, a counter control device which comprises:

a counter means for adding or subtracting "1" each time one cycle of copying operation in the multi-copy mode is completed for displaying one of either the number of copies actually made or the number of copies left unfinished;

a display means for displaying count contents of said counter means;

a means for storing said count contents of said counter means;

a means for determining whether the machine is switched over to said multi-copy mode or said manual feed mode;

a display control means for causing said display means to display "0" and for transferring said count contents of said counter means to said storing means when said determining means determines that the machine is switched over to said manual feed mode and for adding "1" to the figure displayed by said display means each time one cycle of copying operation in said manual feed mode is completed; and

a means for retrieving said count contents stored in said storing means, and for causing said display means to display the thus retrieved count contents when said machine is switched over from said manual feed mode to said multi-copy mode.

4,417,351
STACKED ARTICLE COUNTING APPARATUS

Harry L. Williamson, Franklin, Ky.; Robert A. West, Portland, and Richard P. Manning, Nashville, both of Tenn., assignors to Intercontinental Data Corporation, Portland, Tenn.

Filed Jun. 3, 1981, Ser. No. 272,553
Int. Cl.³ G06M 9/00
U.S. Cl. 377—8 8 Claims

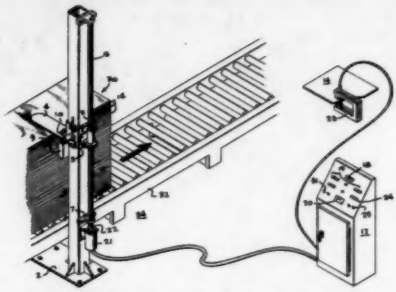
1. Apparatus for determining the height of a stack of sheet-like elements, said apparatus comprising:

(a) platen means movably suspended to sense the top of the stack for providing a terminating signal upon the sensing thereof;

(b) means for providing a train of regular pulses;

(c) drive means responsive to the regular pulses for driving said platen means from an initial position toward the stack; and

(d) counter means responsive to the movement of said platen means from said initial position for initiating the counting of

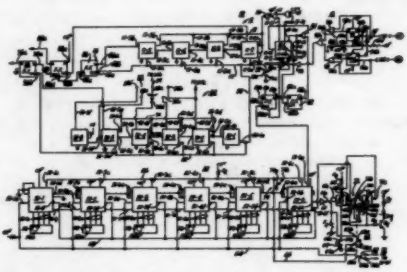


the regular pulses, and responsive to the terminating signal for terminating the counting of the pulses, the number of pulses counted by said counter means being indicative of the height of the stack, whereby the number of sheet-like elements can be determined by said height of the stack.

4,417,352
MICROPHASE STEPPER EMPLOYING IMPROVED DIGITAL TIMING INCREMENTER EMPLOYING A RATE MULTIPLIER

Leonard F. Shepard, Lake Grove, N.Y., assignor to ILC Data Device Corporation, Bohemia, N.Y.

Filed May 5, 1980, Ser. No. 146,512
Int. Cl.³ H03K 5/15, 3/86, 17/28; H03H 7/18
U.S. Cl. 377—43 31 Claims



1. A digital time incrementer for offsetting the phase of an input signal comprising a counter having a plurality of counter stages, each designed to count in binary coded decimal fashion for dividing said input signal by 10^N where N=number of said stages;

at least one of said counter stages having loading means for inserting any desired binary coded decimal value into said one counter stage;

the final stage of said counter producing an output signal;

a high frequency pulse source;

an input for coupling to said source of high frequency pulses;

adjustable digital multiplier means coupled between said input and said counter;

means for loading the predetermined binary coded decimal value applied to said loading means into said one counter stage in response to each output pulse passed by said digital multiplier means when said counter stage reaches a predetermined count;

said digital multiplier means comprising settable means en-

abling said digital multiplier means to pass an output signal comprising a predetermined number of pulses generated by said high frequency pulse source as a function of the setting of said settable means whereby the total phase offset of the output signal of said counter relative to the input signal received by said counter is equal to the sum of the pulses applied to said pre-loading means.

4,417,353

FAN BEAM CT SCANNER WITH COMPENSATING DETECTOR MOTION

Gunther Groh; Hermann Weiss, both of Hamburg; Wolfgang Wagner, Norderstedt; Klaus Pasedach, Hamburg; Gunter Kowalski, Hamburg, and Dietrich Meyer-Ebrecht, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 5, 1977, Ser. No. 756,856

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1976, 2600266

Int. Cl.³ G03B 41/16

U.S. Cl. 378—4 **10 Claims**

1. In a device for measuring radiation absorption differences in a plane of a body wherein a source of radiation produces a fan-like beam of penetrating radiation which passes through the body and is measured by detectors in a detector group which is disposed on an arc of a circle; the source and detector group forming a system which rotates around the body so that the beam passes through the body from a plurality of angular orientations; the extent of the detector group being greater than the width of the fan-like beam whereby, at each angular orientation, a first subgroup of detectors in said group measure radiation which passes through said body and a second subgroup of detectors in said group do not measure radiation which passes through said body; the improvement wherein at each angular orientation the number of detectors in the second subgroup of detectors is substantially equal to or greater than the number of detectors in the first subgroup and further comprising means for pivoting the group about a center of curvature with a motion which is coupled to the rotation of the system so that individual detectors progressively move into and out of the radiation passing through the body at progressive angular positions and each detector in the detector group measures radiation passing through the body at some angular orientation.

4,417,354

DIAGNOSTIC RADIOLOGY INSTALLATION

Manfred Pfeiler, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

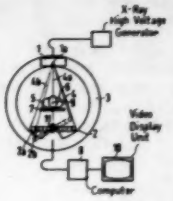
Filed Apr. 6, 1981, Ser. No. 251,056

Claims priority, application Fed. Rep. of Germany, May 7, 1980, 3017494

Int. Cl.³ G03B 41/16

U.S. Cl. 378—19 **5 Claims**

1. A diagnostic radiology installation comprising a patient support, a radiation measuring arrangement comprised of a radiation source, which generates a fan-shaped radiation beam lying in a fan-plane and penetrating the radiography subject, and of a radiation receiver having an array of detectors, means for producing a relative movement between the patient support and the radiation measuring arrangement, and a measurand processing circuit for the formation of an image of the body region scanned during the relative movement, the improvement comprising said radiation receiver being pivotally mounted for pivotal movement about a pivot axis extending perpendicularly to the fan-plane of the radiation beam, said radiation receiver being pivotally movable relative to the radiation beam so as to adjust the resolution of the radiation receiver.



4,417,355

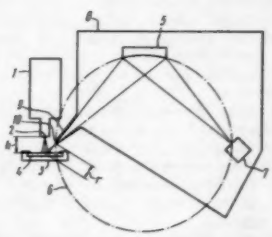
X-RAY FLUORESCENCE SPECTROMETER

Kliment V. Anisovich; Nikolai I. Komyak, and Zaurbek K. Menbaev, all of Leningrad, U.S.S.R., assignors to Leningradskoe NPO "Burevestnik", Leningrad, U.S.S.R.

Filed Jan. 8, 1981, Ser. No. 223,268

Int. Cl.³ G01N 23/22

U.S. Cl. 378—49 **2 Claims**



2. An X-ray fluorescence spectrometer comprising:

an evacuated chamber;

an X-ray source;

a sample holder positioned across the radiation path of said source, said sample holder positioned at such a distance from the focus of said X-ray source that the specific illumination in the central region of the surface of a sample is not less than 0.3 ZU erg/s.cm².w, where Z is the atomic weight of the material of the anode of said X-ray source, and U is the voltage across said X-ray source in kilovolts;

a curved analyzing crystal, the curvature of the planes of said crystal determining the diameter of a focus circle, said analyzing crystal focusing the fluorescent radiation of the sample arranged in said sample holder;

an X-ray detector for recording the radiation focused by said analyzing crystal;

said analyzing crystal and said detector being positioned in said evacuated chamber of the spectrometer and said X-ray source and said sample holder being positioned in the open air outside said evacuated chamber;

said evacuated chamber having a vacuum sealed inlet window transparent to X-rays, said window forming an inlet slot of said spectrometer, said inlet slot being positioned

across the beam of fluorescent X-rays of said sample and arranged at said focus circle;

said sample holder being positioned with respect to said inlet slot in such manner that the average distance between the region on the surface of the sample being analyzed and said inlet slot does not exceed the distance from that region of the sample to the focus of said X-ray source.

4,417,356

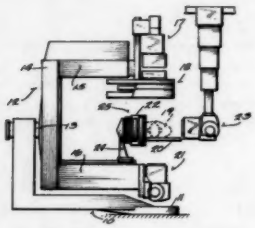
MAGNETIC FRICTION DEVICE

David L. Hoffman, Waukesha, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed May 14, 1981, Ser. No. 263,663

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—181 **12 Claims**



1. Apparatus for x-ray examination of a body that is supported in a predetermined position including an x-ray source operative to project a beam of radiation into said body, support means, and image receptor means for receiving the x-ray image emergent from said body, and

improved means for mounting said receptor means to said support means in a manner that lets said receptor means be moved relative to the support means and x-ray source by applying a predetermined force and that holds said receptor means in a fixed position when said force is discontinued, comprising:

one member coupled to said receptor means and another member coupled to said support means,

means for holding said members in proximity with each other with a gap between them and permitting one member to move in parallelism with the other,

one of said members having a planar surface defined by a magnetic material,

the other member having a surface defined by a nonmagnetic material and having a recess presented toward the planar surface of the magnetic material,

a permanent magnet element having a planar surface and being contained in the recess of the nonmagnetic material, said element being movable in a direction perpendicular to its planar surface for being attracted to the magnetic surface to develoop a frictional force that must be overcome to move one member relative to the other, said magnet element being comprised of a polymer containing magnetized particles.

4,417,357

SPACE-SAVING SELECTOR

Marcel Le Sonn, Paris, France, assignor to Thomson-CSF, Paris, France

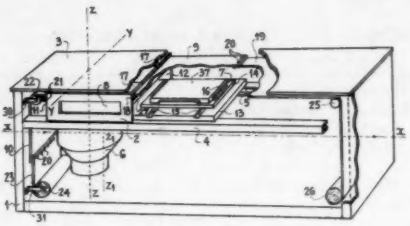
Filed Jun. 3, 1982, Ser. No. 384,750

Claims priority, application France, Jun. 5, 1981, 81 11222

Int. Cl.³ G03B *41/18*

U.S. Cl. 378—177 **10 Claims**

1. In a space-saving selector equipping an examination table of a radiological apparatus in which it is contained, movable over the whole length of said table, comprising: a cassette-carrying plate supporting a radiographic cassette, first drive means for moving said cassette-carrying plate along axes transversal to the exmination table, a second plate supporting said cassette-carrying plate, second drive means for moving said second plate parallel to a longitudinal axis of said table, there are further provided apertures opening at the right and left of the selector on to zones comprising means for protecting said radiographic cassette against X-radiation; said second drive



means, in a first stage, transporting said second plate outside the selector, on one side or the other thereof, so as to place the radiographic cassette in a position sheltered from the X-rays and, in a second stage, re-introducing said second plate into the selector so as to place the radiographic cassette in the radiographic position.

4,417,358

AMPLITUDE MODULATED TRANSMITTER FOR SINGLE SIDEBAND OPERATION

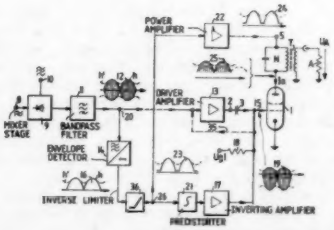
Jürgen Zeis, Berlin, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 22, 1981, Ser. No. 314,046

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3040272

Int. Cl.³ H04B *1/02*

U.S. Cl. 455—109 **9 Claims**



1. In a transmitter of amplitude modulated single sideband signals, which transmitter includes an output stage having a control electrode connected to receive a single sideband input signal having an envelope curve, the output stage having a nonlinear gain characteristic and effecting substantial linear amplification of the single sideband input signal, and a reactance network tuned to the single sideband frequency and connected to the output of the output stage, the improvement wherein;

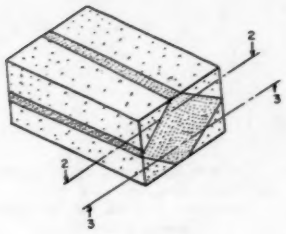
said transmitter further comprises control means connected to said output stage for controlling the current conduction angle at the output of the output stage in a manner to increase the current conduction angle as the amplitude of the input signal decreases;

said control means including signal conduction means for applying the single sideband input signal and a signal derived from the envelope curve of the single sideband

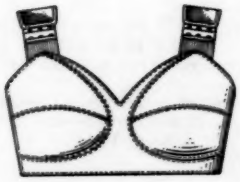
input signal to the control electrode of said output stage without any substantial relative phase shift and in a hysteresis free manner; and

said control means further including current conduction angle varying means for varying the output current conduction angle down to values corresponding to class C amplifier operation for the highest single sideband input signal amplitudes.

271,439
TWO COLOR CHEWING GUM
Robert W. Schumacher, Valley Stream, N.Y., assignor to Warner-Lambert Co., Morris Plains, N.J.
Filed Dec. 12, 1980, Ser. No. 215,985
Term of patent 14 years
Int. Cl. D01—*01*
U.S. Cl. D1—12

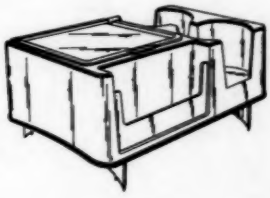


271,440
BRASSIERE
Eula M. Claridge, 112 S. Adelia, Overton, Nev. 89040
Filed Jul. 17, 1981, Ser. No. 284,368
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24



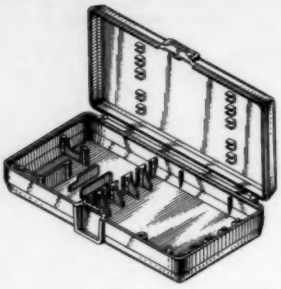
271,441
ALPINE SKI BOOT
George Salomon, and Roger Pitiot, both of Annecy, France, assignors to Ets. Francois Salomon et Fils, Annecy, France
Filed Oct. 22, 1981, Ser. No. 313,919
Claims priority, application France, Apr. 27, 1981, 81 698
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—276

271,442
COMBINED LITTER BASKET AND SNACK TRAY FOR A MOTOR VEHICLE
Daniel F. Lehner, Coshocton, Ohio, assignor to Pretty Products, Inc., Coshocton, Ohio
Filed Feb. 17, 1982, Ser. No. 349,606
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D3—40

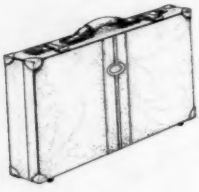


271,443
KEY HOLDER
Sumner MacDonald, 326 Carpenter St., Providence, R.I. 02909
Filed Nov. 30, 1981, Ser. No. 326,170
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—61

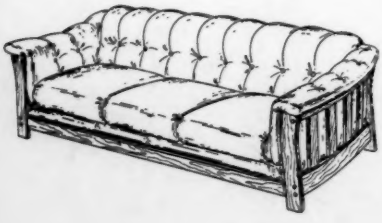
271,444
CARRYING CASE FOR KNIFE SHARPENING APPARATUS
Arthur L. LeVine, P.O. Box 800, Williamsville, N.Y. 14221
Filed Dec. 11, 1981, Ser. No. 329,817
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—74



271,445
ATTACHE CASE
John Y. Kim, Glendale, Calif., assignor to Crown Luggage & Imports, Inc., Los Angeles, Calif.
Filed Aug. 18, 1981, Ser. No. 293,868
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—76



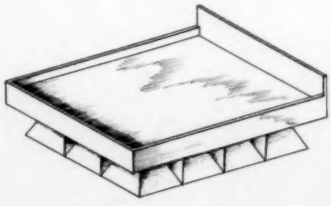
271,446
SOFA
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Apr. 27, 1981, Ser. No. 257,721
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



271,447
CHAIR
Warren H. Snodgrass, 223 Woodland Rd., Kentfield, Calif. 94904
Filed Feb. 25, 1981, Ser. No. 237,999
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

271,448
ARM CHAIR
Arthur C. Crockett, Cincinnati, Ohio, assignor to Simmons Universal Corporation, New York, N.Y.
Filed Oct. 14, 1981, Ser. No. 311,698
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

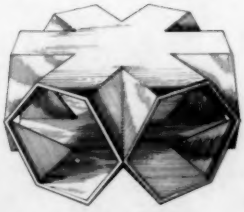
271,449
PLATFORM BED
Joseph W. Dennis, 4054 Little Richmond Rd., Dayton, Ohio 45427
Filed Oct. 3, 1980, Ser. No. 194,181
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—83



271,450
DISPENSER FOR FLUID OR SEMI-FLUID MATERIALS
Gary B. Kleman, St. Louis, Mo., assignor to Calgon Corporation, Pittsburgh, Pa.
Filed Jun. 18, 1981, Ser. No. 275,007
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95

271,451
SKI RACK
David B. Deioma, 35 Greentree Rd., Chagrin Falls, Ohio 44022
Filed Mar. 12, 1979, Ser. No. 19,500
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125

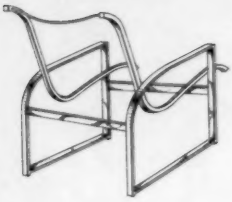
271,452
TABLE
John W. Rozsnyai, 4272 Sheppard Dr., Las Vegas, Nev. 89121
Continuation-in-part of Ser. No. 145,721, May 1, 1980. This application Mar. 24, 1982, Ser. No. 361,574
The portion of the term of this patent subsequent to Nov. 16, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—149



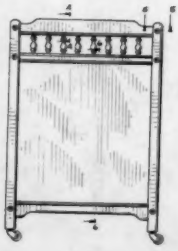
271,453
WINE RACK
William Tucker, 1913 Dupont Ave., Minneapolis, Minn. 55405
Filed May 26, 1981, Ser. No. 266,752
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—157

271,454
EASEL
Bruno Forte, Spreziano, Italy, assignor to Northwest Blueprint & Supply Co., Livonia, Mich.
Filed Jun. 1, 1982, Ser. No. 383,540
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—180

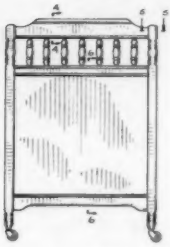
271,455
CHAIR FRAME
Herbert C. Saiger, Troy, Ohio, assignor to Lee L. Woodard Sons, Inc., Owosso, Mich.
Continuation-in-part of Ser. No. 248,723, Mar. 30, 1981. This application Apr. 2, 1982, Ser. No. 365,018
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



271,456
CRIB FOOTBOARD
Merlin A. Brunner, New London; Harvey J. Draheim, Weyauwega, and Michael J. Schaffer, New London, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Aug. 7, 1981, Ser. No. 290,990
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—198



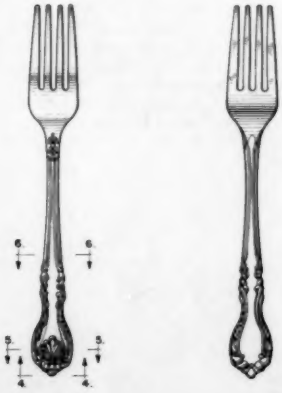
271,457
CRIB FOOTBOARD
Merlin A. Brunner, New London; Harvey J. Draheim, Weyauwega, and Michael J. Schaffer, New London, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Aug. 7, 1981, Ser. No. 290,991
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—198



271,458
PICTURE FRAME
George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002
Filed Jul. 6, 1981, Ser. No. 280,873
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—245

271,459
GOBLET
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Nov. 30, 1981, Ser. No. 325,915
Claims priority, application Switzerland, May 29, 1981, 71465.
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—13

271,460
FORK OR SIMILAR ARTICLE
Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed Sep. 25, 1981, Ser. No. 305,551
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137



271,461
FORK OR SIMILAR ARTICLE
Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed Sep. 25, 1981, Ser. No. 305,718
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—150

271,462
SANITARY MACHINE FOR STORING AND DISPENSING PARTICULATE ICE AND FOR DISPENSING BEVERAGE
Charles M. Lents, Leon Valley, Tex., assignor to Stainless Icetainer Company, San Antonio, Tex.
Filed Mar. 23, 1981, Ser. No. 246,466
The portion of the term of this patent subsequent to Jun. 29, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D7—305

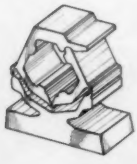
271,463
SANITARY COUNTERTOP MACHINE FOR STORING AND DISPENSING PARTICULATE ICE AND FOR DISPENSING BEVERAGE
Charles M. Lents, Leon Valley, Tex., assignor to Stainless Icetainer Company, San Antonio, Tex.
Filed Mar. 23, 1981, Ser. No. 246,467
The portion of the term of this patent subsequent to Jun. 29, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D7—305

271,464
COMBINED KNOB AND ESCUTCHEON FOR CABINETS OR THE LIKE
Robert D. Carlson, Fullerton, Calif., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.
Filed Sep. 28, 1981, Ser. No. 305,938
Term of patent 14 years
Int. Cl. D8—*06, 09*
U.S. Cl. D8—301

271,465
SAFETY HOOK
Michel Boissonnet, Thiers, France, assignor to S.A.R.L. Wichard, Thiers, France
Filed Apr. 7, 1981, Ser. No. 251,781
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

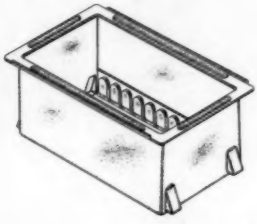
271,466
SAFETY HOOK
Michel Boissonnet, Thiers, France, assignor to S.A.R.L. Wichard, Thiers, France
Filed Jul. 14, 1981, Ser. No. 283,293
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

271,467
SNAP-ACTION CLIP
Keizaburo Sakaguchi, Tokyo, Japan, assignor to Sakaguchi Plastic Industrial Co., Ltd., Tokyo, Japan
Filed Jun. 25, 1981, Ser. No. 276,908
Claims priority, application Japan, Dec. 25, 1980, 55-54277
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382



271,468
BOTTLE
Vilmos Soos, Toronto, Canada, assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Sep. 14, 1980, Ser. No. 301,710
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—377

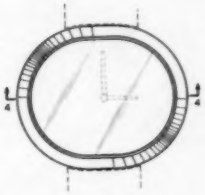
271,469
STACKABLE BOX
Barry Dep, Castro Valley, Calif., assignor to United Plastics Corporation, Oakland, Calif.
Filed Jul. 13, 1981, Ser. No. 282,928
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—425



271,470
PIERCED EAR-RING HOLDER
Howard Lauck, 17 Blossom Ct., Daly City, Calif. 94014
Filed Mar. 23, 1981, Ser. No. 246,900
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—457

271,471
COMBINED WRIST WATCH AND ARM BAND
Giovanni Bulgari, Rome, Italy, assignor to Anthos S.A., Geneva, Switzerland
Filed Oct. 1, 1981, Ser. No. 307,443
Claims priority, application Hague, Apr. 3, 1981, DM/000 671
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—32

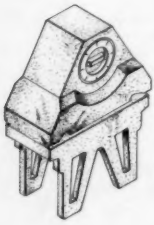
271,472
WATCHCASE
Jean G. Malamoud, Saint-Jorioz, France, assignor to S. T. Dupont, Paris, France
Filed Jul. 30, 1980, Ser. No. 173,771
Claims priority, application France, Feb. 1, 1980, 80 0188
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



271,473
WRISTWATCH
Toshiyuki Dobashi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan
Filed Oct. 1, 1981, Ser. No. 307,522
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

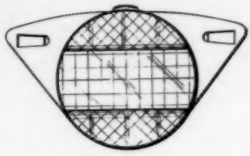
271,474
THERMOREGULATOR
Gustave J. Klein, Great Neck, N.Y., assignor to Revlon Realistic Professional Products, Inc., Cincinnati, Ohio
Filed Sep. 3, 1981, Ser. No. 298,851
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50

271,475
HOUSING FOR A STOP MOTION
Raymond L. Lagueux, Charlotte, N.C., assignor to IRO, Inc., South Windsor, Conn.
Filed Apr. 27, 1981, Ser. No. 257,799
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—103



271,476
INDICATOR FOR A RURAL MAILBOX
Allen Gaudet, Sr., 1217 Blue Hills Ave., Bloomfield, Conn. 06002
Filed Sep. 25, 1980, Ser. No. 190,940
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109

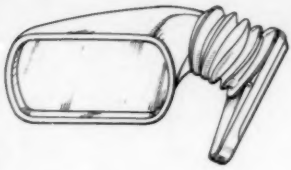
271,477
DECORATIVE BICYCLE WHEEL LIGHT REFLECTOR
David Kalish, 26 Westminister Ave., Venice, Los Angeles County, Calif. 90291
Filed Jul. 1, 1981, Ser. No. 279,463
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111



271,478
NECKLACE OR THE LIKE
Pepi G. Kelman, 19264 Pacific Coast Hwy., Malibu, Calif. 09265
Filed Mar. 22, 1982, Ser. No. 360,613
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—6

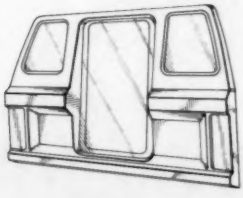
271,479
GRASSHOPPER FIGURE
Tatsuya Kodaka, 25-6, Wakamiya 1-chome, Nakano-ku, Tokyo, Japan
Filed Nov. 12, 1981, Ser. No. 320,729
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—162

271,480
REAR VIEW MIRROR
Alberto Vitaloni, Turin, Italy, assignor to Vitaloni S.p.A., Turin, Italy
Filed Mar. 3, 1981, Ser. No. 239,929
Claims priority, application Italy, Oct. 14, 1980, 53577/80[U]
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—187

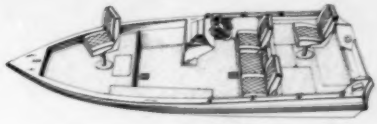


271,481
MAT FOR AN AUTOMOTIVE DASHBOARD
Gerald Y. Sugai, 4304 East Springfield St., Simi Valley, Calif. 93063
Filed Aug. 17, 1981, Ser. No. 293,378
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—192

271,482
PICK-UP TRUCK REAR PANEL
John Collins, Elkhart, Ind., assignor to Leer, Inc., Elkhart, Ind.
Filed Jun. 17, 1981, Ser. No. 274,713
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—196

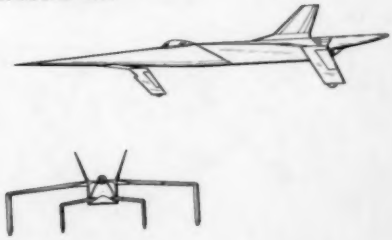


271,483
BOAT
Forrest L. Wood; Mickey C. Wood, both of Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Incorporated, Flippin, Ark.
Filed Jun. 5, 1981, Ser. No. 270,797
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—300

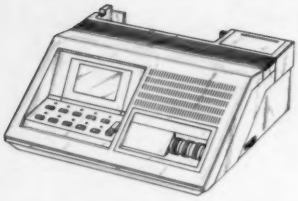


271,484
BOAT
Forrest L. Wood; Mickey C. Wood, both of Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Incorporated, Flippin, Ark.
Filed Jun. 5, 1981, Ser. No. 271,005
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—300

271,485
AIRCRAFT
Morgan Z. Tucson, 920 Johnson Ave., #230, Arlington, Tex. 76011
Filed Dec. 12, 1980, Ser. No. 215,570
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—332



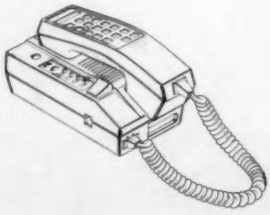
271,486
DICTATING MACHINE
Peter J. Doodson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 2, 1981, Ser. No. 250,369
Claims priority, application Benelux, Oct. 6, 1980, 55075-00
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—3



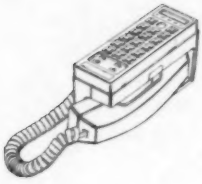
271,487
TELEPHONE INSTRUMENT
Carl-Arne Breger, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Dec. 4, 1980, Ser. No. 213,009
Claims priority, application Sweden, Jun. 9, 1980, 801158
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

271,488
DESK TELEPHONE
Ting H. Mak, 7816 Mulberry Bottom La., Springfield, Va. 22153
Filed Apr. 30, 1981, Ser. No. 259,116
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

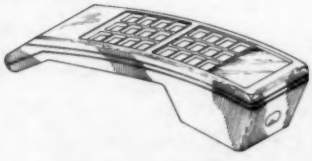
271,489
TELEPHONE SET
Hisao Fukushima, and Masaharu Tarao, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jul. 6, 1981, Ser. No. 280,284
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



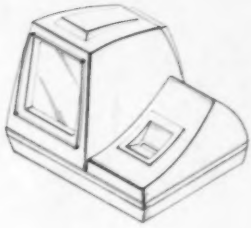
271,490
TELEPHONE SET
Hisao Fukushima, and Masaharu Tarao, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jul. 6, 1981, Ser. No. 280,285
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



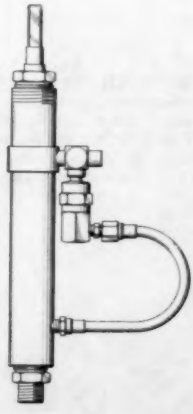
271,491
CONTROL UNIT FOR A TWO-WAY RADIO OR SIMILAR ARTICLE
Terrance N. Taylor, Cary, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 12, 1981, Ser. No. 293,041
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—76



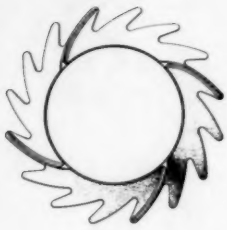
271,492
MERCHANDISING TERMINAL
William E. Roberts, Rolling Hills Estates, Calif., assignor to Logicon, Inc., Torrance, Calif.
Filed Jul. 2, 1981, Ser. No. 279,796
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—106



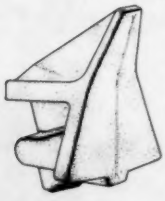
271,493
PUMP FOR TRANSFERRING SOLID MATERIAL AND THE LIKE
Sam D. McMullen, Houston, Tex., assignor to Matcote Company, Inc., Houston, Tex.
Filed Sep. 14, 1981, Ser. No. 302,137
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7



271,494
SKIRT FOR AGRICULTURAL MACHINES FOR MOVING FODDER
Pierre Kaetzel, Saverne, France, assignor to Belrecolt S.A., Marmoutier, France
Division of Ser. No. 143,295, Apr. 24, 1980. This application Jun. 22, 1982, Ser. No. 390,862
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—10

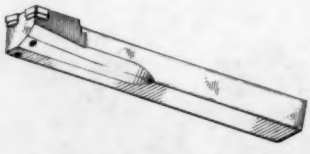


271,495
CUTTER TOOTH FOR SUCTION DREDGERS
Torsten Larsson, and Arne Johansson, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden
Filed Dec. 29, 1980, Ser. No. 220,384
Claims priority, application Sweden, Jul. 15, 1980, 80-1405
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—29



271,496
SANITARY COUNTERTOP MACHINE FOR STORING AND DISPENSING PARTICULATE ICE
Charles M. Lents, Leon Valley, Tex., assignor to Stainless Ice-tainer Company, San Antonio, Tex.
Filed Mar. 23, 1981, Ser. No. 246,465
The portion of the term of this patent subsequent to Jun. 29, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—80

271,497
COMBINED CUTTING TOOLS AND HOLDER THEREFOR
Charles L. Green, 7536 Atoll Ave., North Hollywood, Calif. 91605
Filed Jan. 21, 1981, Ser. No. 226,625
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—139

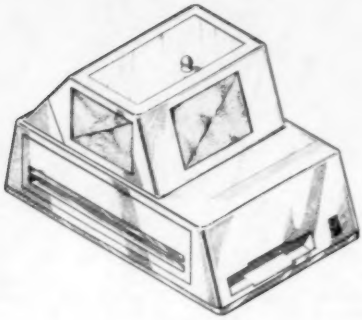


271,498

PHOTOGRAPHIC PROCESSOR

Montague Everett, Greenwich, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,464
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D16—33

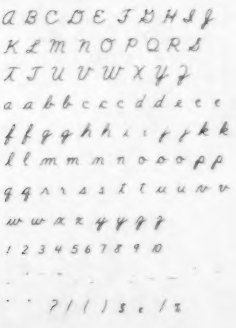


271,499

PRINTED TYPE FONT

Marjorie L. Burns, New York, N.Y., assignor to Steck-Vaughn Company, Austin, Tex.

Filed Apr. 16, 1981, Ser. No. 254,863
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—28



271,500

READING MACHINE FOR ADVANCING AND DISPLAYING READING MATERIAL FOR PHYSICALLY HANDICAPPED PERSONS

George A. Monick, 3075 N. Quincy St., Arlington, Va. 22207

Filed May 5, 1981, Ser. No. 260,948
The portion of the term of this patent subsequent to Jan. 12, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—91

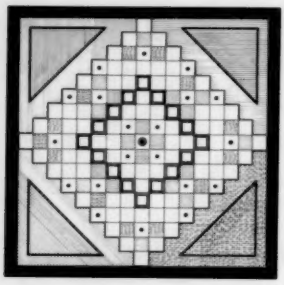
271,501

ADJUSTABLE SUPPORT SURFACE FOR HOLDING REFERENCE OR PRINTOUT MATERIAL

John B. Manning, Worcester, and David K. Crabbe, Millbury, both of Mass., assignors to Wright Line Inc., Worcester, Mass.

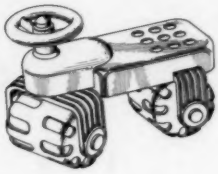
Filed Aug. 31, 1981, Ser. No. 298,136
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91

271,502
GAME BOARD
Sharon E. Zeldin, 38506 Calle de la Siesta, Murrieta Hot Springs, Calif. 92362
Filed Oct. 2, 1981, Ser. No. 307,797
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—24

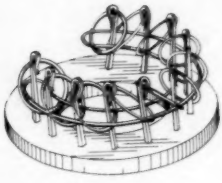


271,503
TOY ROCKING HORSE
Mark L. Brantingham, 1717 Hallock Young Rd. SW., Lordstown, Ohio 44481
Filed Nov. 12, 1981, Ser. No. 320,344
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—75

271,504
TOY VEHICLE
Marc Rivollet, Oyonnax, France, assignor to Etablissements Fernand Berchet, Oyonnax, France
Filed Jul. 13, 1981, Ser. No. 282,749
Claims priority, application France, Jan. 12, 1981, 810082
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—76

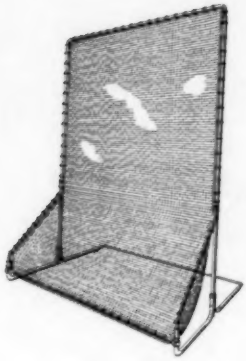


271,505
RING PUZZLE
Charles M. Honeycutt, Rte. 1, Box 425, Mt. Pleasant, N.C. 28124
Filed Jan. 15, 1982, Ser. No. 339,400
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—106



271,506
TOY FIGURE
James R. Lewis, Cincinnati, Ohio, assignor to CPG Products Corp., Minneapolis, Minn.
Filed Dec. 7, 1981, Ser. No. 328,292
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—171

271,507
TENNIS BALL PRACTICE CATCH NET OR THE LIKE
Vanice C. Phillips, 2401 Shady Grove, Bedford, Tex. 76021, and Glendale Phillips, R.R. 2, Box 708, Scurry, Tex. 75158
Filed Sep. 21, 1981, Ser. No. 304,118
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—200



271,508
RETURN CHUTE ATTACHMENT FOR BASKETBALL HOOPS
Gerald R. McGregor, P.O. Box 1983, Kamuela, Hi. 96743
Filed May 7, 1981, Ser. No. 261,493
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—201

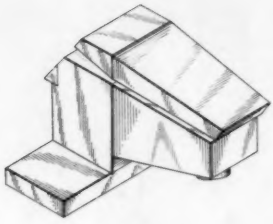
271,509
GOLF TEE
Richard W. Hanson, 9875 SW. Murdock St., Tigard, Oreg. 97223
Filed Feb. 12, 1982, Ser. No. 348,601
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—208

271,510
BAT
Ian G. Gormley, Durban, South Africa, assignor to Zimm-Zamm AG, Sug, Switzerland
Filed Apr. 13, 1981, Ser. No. 253,353
Claims priority, application United Kingdom, Oct. 13, 1980, 997003
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—213

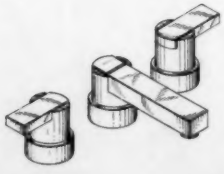
271,511
SLING FOR A RIFLE
Thomas A. Horst, Lafayette, Colo., assignor to Crockett & Kelly, Inc., Westminster, Colo.
Filed Oct. 9, 1981, Ser. No. 309,903
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7

271,512
RIFLE SLING
Thomas A. Horst, Lafayette, Colo., assignor to Crockett & Kelly, Inc., Westminster, Colo.
Filed Oct. 9, 1981, Ser. No. 309,904
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7

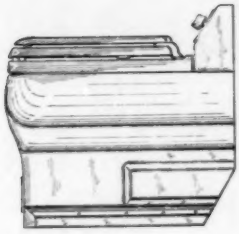
271,513
FAUCET
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed Jun. 17, 1981, Ser. No. 274,580
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—23

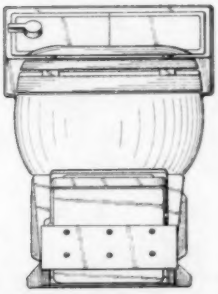


271,514
FAUCET SET
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed Jun. 17, 1981, Ser. No. 274,579
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25



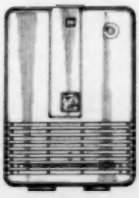
271,515
SEWERLESS TOILET OR SIMILAR ARTICLE
Kenneth J. DeGraw, Montvale, and Earl W. Nickerson, Ocean City, both of N.J., assignors to American Standard Inc., New York, N.Y.
Filed Nov. 12, 1981, Ser. No. 320,271
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48



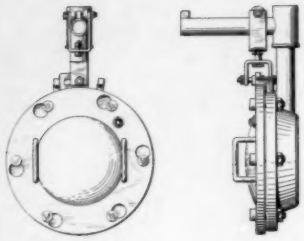


271,516
SPLASH SHIELD
John H. Dose, deceased, late of Bradenton, Fla., and by Mildred V. Dose, executrix, 3113 S. 122nd Ave., Omaha, Nebr. 68144
Continuation-in-part of Ser. No. 96,139, Nov. 20, 1979, which is a continuation of Ser. No. 859,988, Dec. 12, 1977, abandoned.
This application Nov. 9, 1981, Ser. No. 319,790
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

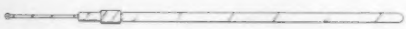
271,517
AIR FRESHENER DISPENSER OR SIMILAR ARTICLE
Yasuyuki Mori, Osaka, Japan, assignor to Duskin Franchise Co., Ltd., Osaka, Japan
Filed Feb. 20, 1981, Ser. No. 236,563
Claims priority, application Japan, Jun. 17, 1980, 55-24078
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



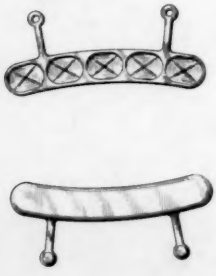
271,518
CLOSURE FOR A PRESSURE DEVICE
Robert J. Lankston, Shawnee, Kans., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.
Filed Apr. 8, 1981, Ser. No. 252,504
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—1



271,519
COMBINED INOCULATING LOOP WITH BREAKAWAY STOPPER THEREFOR
LaVerne K. Baitz, Austin, Tex., assignor to K-Loops, Inc., Austin, Tex.
Filed Aug. 30, 1982, Ser. No. 413,174
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—8

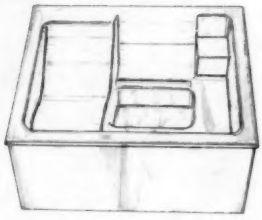


271,520
DILUTION VESSEL
Raymond J. Herrmann, Westlake, Ohio, assignor to Corning Glass Works, Corning, N.Y.
Filed Jul. 30, 1982, Ser. No. 404,582
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—29

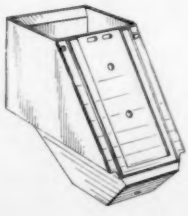


271,521
PUMP HANDLE FOR USE WITH A BIOPSY SPECIMEN COLLECTOR
James P. Ryan, Newton, and Roy W. Downing, Hingham, both of Mass., assignors to Ashbourne Development Corporation, Louisville, Ky.
Filed Aug. 11, 1980, Ser. No. 176,824
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—30

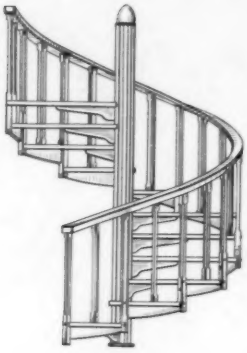
271,522
WHIRLPOOL TUB
Robert B. Wiley, 436 4th Ave. North, Tierra Verde, Fla. 33715
Filed May 5, 1981, Ser. No. 260,797
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02;* D25—*99*
U.S. Cl. D24—38



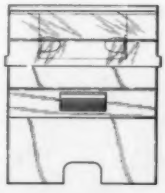
271,523
SOAK TUB
Ferne T. Richburg, 6033 N. Sheridan Rd., Chicago, Ill. 60660
Filed Jul. 8, 1981, Ser. No. 281,427
Term of patent 14 years
Int. Cl. D24—*01;* D23—*02;* D25—*99*
U.S. Cl. D24—38



271,524
SPIRAL STAIRWAY
Abraham Suckno, 289 Friar La., Mountainside, N.J. 07092
Filed Feb. 17, 1981, Ser. No. 234,883
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—63

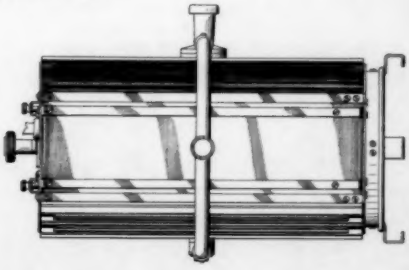


271,525
FLASHLIGHT
Hoyt W. Axton, Tahoe City, and Corey B. Bailey, Lake View Terrace, both of Calif., assignors to Sierra Survival Company, Inc., Ada, Okla.
Filed Jun. 15, 1981, Ser. No. 274,060
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—37



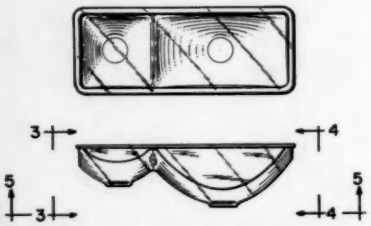
271,526
PORTABLE READING LIGHT
Noel E. Zeller, 95 Milford Point Rd., Milford, Conn. 06460
Filed Dec. 21, 1981, Ser. No. 332,291
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—60

271,527
LIGHTING FIXTURE
Terry L. Hershey, Valencia, Calif., assignor to Mole-Richardson Co., Hollywood, Calif.
Filed Nov. 17, 1980, Ser. No. 207,282
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D26—63



271,528
LIGHTING FIXTURE
Henry Muller, Rego Park, N.Y., assignor to Lightolier Incorporated, Jersey City, N.J.
Filed Jul. 17, 1981, Ser. No. 284,241
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—85

271,529
GLASS REFLECTOR FOR DUAL HEADLIGHT ASSEMBLY
Garo M. Ziver, Pine City, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Jul. 15, 1981, Ser. No. 283,682
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—118

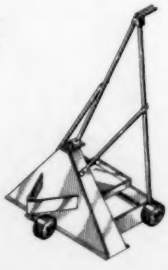


271,530
MASCARA SMUDGE SHIELD
Beryl N. Watt, 15 Oak Ave., Tarrytown, N.Y. 10591
Filed Nov. 29, 1982, Ser. No. 444,838
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7

271,531
DISPOSABLE RAZOR WITH SLIDING CAP
David S. Byrne, Atlantic Highlands, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Feb. 5, 1982, Ser. No. 345,991
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46

271,532
GLASS WASHING MACHINE
Quarterman Lee, Jackson County, Mo., assignor to T.C.A., Inc., Va.
Filed Jan. 12, 1982, Ser. No. 338,832
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—2

271,533
SPRAY CART
Leon Kinder, P.O. Box 264, Jacksboro, Tex. 76201
Filed Jun. 29, 1981, Ser. No. 278,175
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—18



REEXAMINATIONS

NOVEMBER 22, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 29,221 (138th)

ACCELERATION SENSITIVE MOTION SNUBBER

Elmer C. Yang, Orange, Calif., assignor to Pacific Scientific Company, Anaheim, Calif.

Reexamination Request Nos. 90/000,180, Mar. 29, 1982 and 90/000,229, Jul. 19, 1982.

Reexamination Certificate for Reissue Patent Re. 29,221, issued May 17, 1977, Ser. No. 685,949, May 13, 1976.

Original No. 3,876,040, dated Apr. 8, 1975, Ser. No. 402,451, Oct. 1, 1973.

Int. Cl.[3] **F16F** *7/10*

U.S. Cl. 188—378

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–26** and **33–35** is confirmed.

Claims **27, 29, 30** and **36** are determined to be patentable as amended:

Claims **28, 31** and **32**, dependent on amended claims, are determined to be patentable.

1. A motion snubbing device comprising:

a pair of members mounted for relative movement with respect to each other; and

acceleration sensitive means connected to said members for limiting movement of either of the member relative to the other member in either of two opposite directions to a predetermined threshold acceleration rate while permitting continued relative movement at said threshold and including means for preventing operation of said limiting means below said predetermined acceleration thus permitting repeated or continuous relative movement below said predetermined threshold both before and after said predetermined acceleration has been reached.

B1 3,512,495 (137th)

SELECTIVELY CONNECTABLE BOAT AND BARGE

Edwin H. Fletcher, Jacksonville, Fla., assignor to United States Freight Company, New York, N.Y.

Reexamination Request Nos. 90/000,082, Oct. 9, 1981 and 90/000,287, Nov. 12, 1982.

Reexamination Certificate for Patent No. 3,512,495, issued May 19, 1970, Ser. No. 588,162, Oct. 20, 1966.

Int. Cl.[3] **B63B** *3/02, 21/00*

U.S. Cl. 114—248

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **5, 7–15, 35,** and **36** is confirmed.

Claims **3** and **6**, having been finally determined to be unpatentable, are cancelled.

Claims **1, 4, 17–20, 25, 26,** and **30–34** are determined to be patentable as amended:

Claims **2, 16, 21–24,** and **27–29**, dependent on amended claims, are determined to be patentable.

New claim **37** is added and determined to be patentable.

1. The combination comprising an independent powerless cargo carrying watercraft, an independent powered watercraft for pushing the cargo carrying watercraft, said cargo carrying watercraft comprising means defining an opened bottom well in its stern portion, the bow portion of said powered watercraft having a normal ship-shaped bow terminating in a stem and disposable in said well with said bow portion being adjacent to and spaced from said well-defining means, and selectively operable pivotal connecting means establishing a horizontal laterally extending pivot axis connecting between said stern portion and said bow portion for pivotally connecting said powered watercraft to said cargo carrying watercraft, said *cargo carrying craft including means which receive the connecting means and which have a top and bottom portion which are located and extend above and below the connecting means received therein to contact top and bottom portions of the connecting means to restrain and limit movement of the connecting means in the vertical direction, said connecting means in said receiving means* providing a positive force transmitting connection between said cargo carrying watercraft and said powered watercraft operable during both forward and reverse movement of said powered watercraft, said selectively operable *connecting* means permitting free pivotal motion about said axis between said cargo carrying watercraft and said powered watercraft and being selectively operable to disconnect said powered watercraft from said cargo carrying watercraft.

B1 4,134,769 (139th)

OFFSET PRINTING PLATE

Akio Yoshida; Akira Tanaka, and Yasuo Tsubai, all of Nagaoka-kyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Reexamination Request No. 90/000,306, Dec. 10, 1982.

Reexamination Certificate for Patent No. 4,134,769, issued Jan. 16, 1979, Ser. No. 822,192, Aug. 5, 1977.

Claims priority, application Japan, Aug. 10, 1976. 51-95274

Int. Cl.[3] **G03C** *5/54, 1/48;* **G03F** *7/02;* **B41M** *1/00*

U.S. Cl. 430—199

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–8**, having been finally determined to be unpatentable, are cancelled.

New claims **9–30** are added and determined to be patentable.

9. A method of printing which comprises printing in an offset printing machine with an offset printing plate comprising a support, a silver halide emulsion layer on the support containing at least one dye selected from the group consisting of betaine type cyanine sensitizing dyes and anion type cyanine sensitizing dyes and a surface layer containing nuclei for physical development on the emulsion layer, said surface layer having thereon an oleophilic ink-receptive silver deposited from said silver halide emulsion layer by exposing and subsequently developing with silver complex diffusion transfer developer.

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF NOVEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Tinnis, Valentin, 4,416,422., Cl. 239-455.000.

A. O. Smith Harvestore Products, Inc.: *See*—
Kretschmer, Stephen L., 4,416,549., Cl. 366-190.000.

Aanerud, Lars; and Balog, Georg, to International Standard Electric Corporation. Method for jointing cables. 4,416,061., Cl. 29-828.000.

AB Asea-Atom: *See*—
Nylund, Olov, 4,416,852., Cl. 376-438.000.

Abbruscato, Charles R., to Bell Telephone Laboratories, Incorporated. Errorless line protection switcher. 4,417,348., Cl. 375-40.000.

Abdel-Messeh, William, to Pratt & Whitney Aircraft of Canada Limited. Blade cooling for gas turbine engine. 4,416,585., Cl. 416-97.00R.

Abdoulin, Edgar; and Lidow, Alexander, to International Rectifier Corporation. Method of manufacture of high speed, high power bipolar transistor. 4,416,708., Cl. 148-187.000.

Abe, Kazunobu; and Nakatsuji, Tadao, to Sakai Chemical Industry Co., Ltd. Method for producing a catalyst and a carrier therefor including heat-resistant fibers. 4,416,800., Cl. 502-159.000.

Abramian, Grant I.: *See*—
Pelts, Boris B.; Tumasian, Beniamin A.; Egorov, Leonid P.; Zatulovsky, Lev M.; Chaikin, Peter M.; Freiman, Efim A.; Chalian, Eduard A.; Abramian, Grant I.; Azoian, Stepan E.; and Kostandian, Kliment A., 4,416,723., Cl. 156-608.000.

Abrams, Richard F.; and Chellis, James G., to Koch Process Systems, Inc. Radioactive waste treatment apparatus. 4,416,855., Cl. 422-111.000.

Ackermann, Otto; and Daum, Gerhard, to Dynamit Nobel A.G. Process for the preparation of substituted acetic acids and derivatives thereof. 4,417,073., Cl. 560-105.000.

Adair, Paul C.: *See*—
Sanders, Frederick W.; Wright, Richard F.; and Adair, Paul C., 4,416,966., Cl. 430-138.000.

Adams, Don L.: *See*—
Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., 4,417,308., Cl. 364-434.000.

Adams, Lonnie D.; and Sammons, David W., to Upjohn Company, The. Silver stain procedure and kit for same. 4,416,998., Cl. 436-86.000.

Adams, Robert W.; and Donohoe, Charles R. Rocket retention and ignition system. 4,416,183., Cl. 89-1.807.

Adamson, John: *See*—
Duncombe, Edward; Gratton, Charles P.; and Adamson, John, 4,416,851., Cl. 376-399.000.

Adecon, Inc.: *See*—
Morrone, Joseph A., III, 4,416,038., Cl. 24-255.0SL.

Adeka Argus Chemical Co., Ltd.: *See*—
Minagawa, Motonobu; Inoue, Tetsuyu; and Kurita, Naoyasu, 4,416,797., Cl. 252-400.00A.

Adolfsson, Morgan; Brogardh, Torgny; and Ovren, Christer, to ASEA Aktiebolag. Fibre optic measuring device with electrically controlled photoluminescence. 4,417,140., Cl. 250-227.000.

Adur, Ashok M., to Chemplex Company. Composite structures. 4,416,944., Cl. 428-349.000.

Aerodyne Research, Inc.: *See*—
Mueller, Peter F.; and Caulfield, H. John, 4,416,538., Cl. 355-67.000.

Aeromator Trading Company AB: *See*—
Skogstrom, Lars; and Bergqvist, Bengt, 4,416,259., Cl. 126-429.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Beck, Wilfried; and Kauschus, Fritz, 4,416,918., Cl. 427-296.000.
Beck, Wilfried, 4,416,919., Cl. 427-296.000.
Kastl, Alfons, 4,416,529., Cl. 354-320.000.

Agnor, William C.; and Elder, James H., to General Electric Company. Paging receiver having a serial code plug. 4,417,246., Cl. 340-825.440.

Agre, Arnold: *See*—
Ewer, Gerald; and Agre, Arnold, 4,416,103., Cl. 53-517.000.

Aharoni, Shaul M.; and Largman, Theodore, to Allied Corporation. Process for preparing graft and block copolymers. 4,417,031., Cl. 525-425.000.

Aharoni, Shaul M.: *See*—
Khanna, Yash P.; Turi, Edith A.; Aharoni, Shaul M.; and Largman, Theodore, 4,417,032., Cl. 525-432.000.

Ahlf, Heinz-Jurgen; and Guhne, Wieland, to Vorwerk & Co. Interholding GmbH. Front-suction arrangement on a vacuum cleaner. 4,416,034., Cl. 15-354.000.

Ahmed, Adel A. A., to RCA Corporation. Plural output switched current amplifier as for driving light emitting diodes. 4,417,240., Cl. 340-782.000.

Aho, Yrjo, to Exel Oy. Fastening means for the wrist strap of a ski stick and method for the manufacture thereof. 4,416,036., Cl. 24-136.00R.

Ahr, Nicholas A.: *See*—
Moret, David M.; and Ahr, Nicholas A., 4,416,025., Cl. 2-49.00R.

Air Preheater Company, Inc., The: *See*—
Stockman, Richard F.; and Macler, Paul L., 4,416,044., Cl. 29-157.30R.

Air Products and Chemicals, Inc.: *See*—
Daughenbaugh, Randall J.; and Dixon, Dale D., 4,417,074., Cl. 564-479.000.
Elton, Edward F.; and Magnotta, Vincent L., 4,416,727., Cl. 162-6.000.
Ross, David S.; Johnson, Robert M., Jr.; and Malhotra, Ripudaman, 4,417,080., Cl. 568-939.000.

Aisin Seiki Co., Ltd.: *See*—
Suzuki, Kiyohita; Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; Ban, Hiroshi; and Ishida, Nobuyasu, 4,416,361., Cl. 192-107.00M.

Aisin Seiki Kabushiki Kaisha: *See*—
Katagiri, Masayoshi; Fujii, Takashi; and Ogura, Osamu, 4,416,188., Cl. 91-369.00B.

Aizawa, Hitomi, to Kabushiki Kaisha Suwa Seikosha. Anti-chatter circuit for small portable apparatus. 4,417,155., Cl. 307-247.00A.

Akagi, Noriyuki: *See*—
Ogawa, Yoshinari; Akagi, Noriyuki; Ikeda, Kenji; and Nakamura, Yoichi, 4,417,018., Cl. 524-261.000.

Akae, Masazumi: *See*—
Aoki, Susumu; Asaumi, Hiroshi; Take, Shigeo; and Akae, Masazumi, 4,416,043., Cl. 29-132.000.

Akita, Sigeyuki: *See*—
Kago, Yoshiyuki; and Akita, Sigeyuki, 4,416,150., Cl. 73-119.00A.

Akiyama, Junichi, to Shimadzu Corporation. Electrophoretic apparatus. 4,416,762., Cl. 204-299.00R.

Akzona Incorporated: *See*—
McCorsley, Clarence C., III, 4,416,698., Cl. 106-163.00R.

Albanesi, Giancarlo; and Rinaldi, Gianfranco, to Saffa S.p.A. Self-extinguishing paper materials. 4,416,728., Cl. 162-159.000.

Alben, Richard S.: *See*—
Herrick, Carlyle S.; and Alben, Richard S., 4,416,264., Cl. 126-442.000.

Albert-Frankenthal AG: *See*—
Fischer, Rudolf; and Stab, Rudolf, 4,416,652., Cl. 493-399.000.

Alberti, John, to Boeing Company, The. Power-actuated low profile cargo guide. 4,416,579., Cl. 414-534.000.

Alberts, Heinrich: *See*—
Muisers, Hans-Ferdinand; Arlt, Dieter; Jautelat, Manfred; Alberts, Heinrich; and Mietzsch, Fritz, 4,417,037., Cl. 526-271.000.

Albrecht, Joachim; Duerig, Thomas; Mercier, Olivier; and Weber, Walter, to BBC Brown, Boveri & Company Limited. Process to produce and stabilize a reversible two-way shape memory effect in a Cu-Al-Ni or a Cu-Al alloy. 4,416,706., Cl. 148-11.50C.

Alfa-Laval N.V.: *See*—
Van Vlaenderen, Johannes M. H., 4,416,326., Cl. 165-120.000.

Alfred University Research Foundation Inc.: *See*—
Funk, James E., 4,416,666., Cl. 44-51.000.

Aliberti, Vincent A.; Kruse, Robert L.; and Valcarce, Eduardo M., to Monsanto Company. Mass polymerization process for ABS polyblends. 4,417,030., Cl. 525-316.000.

Allen Industries, Inc.: *See*—
Flowers, Thomas A.; Vinch, Samuel D.; and Shahani, Chandru T., 4,416,931., Cl. 428-159.000.

Allen, Jonathan B., to Bell Telephone Laboratories, Incorporated. Noise and bit rate reduction arrangements. 4,417,102., Cl. 364-513.000.

Allen Organ Company: *See*—
Wise, Stephen A.; and Whitefield, John T., 4,416,182., Cl. 84-470.00R.

Allied Corporation: *See*—
Aharoni, Shaul M.; and Largman, Theodore, 4,417,031., Cl. 525-425.000.
Khanna, Yash P.; Turi, Edith A.; Aharoni, Shaul M.; and Largman, Theodore, 4,417,032., Cl. 525-432.000.
Marshall, Robert M.; Archie, William A.; and Dardoufas, Kimon C., 4,416,787., Cl. 252-8.800.

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Zagar, Steven J.; and Shy, James L., 4,416,696., Cl. 106-100.000.
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Alpha Poultry & Livestock Equip., Inc.: *See*—
Novey, Richard T., 4,416,221., Cl. 119-72.500.

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Kamijo, Yoshimi; and Kawachi, Kazuhiko, 4,417,174., Cl. 313-502.000.
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Das, Subodh K., 4,417,097., Cl. 174-110.00A.

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Tsutsumi, Akira, 4,417,125., Cl. 219-121.0LY.

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Fukui, Hiroshi; Kimura, Shin; Onda, Kenichi; and Amano, Hisao, 4,417,156., Cl. 307-252.00C.

Amano, Takayoshi: *See—*
Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; and Amano, Takayoshi, 4,416,158., Cl. 73-842.000.

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Clare, Kenneth D.; and Ambrose, Michael F. J., 4,416,385., Cl. 220-1.500.

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Wilkinson, Harlen E.; and Wren, Fred W., 4,416,389., Cl. 220-269.000.

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Bochskandl, Margarete, 4,416,901., Cl. 424-363.000.

American Hoechst Corporation: *See—*
Bolt, Lawrence, 4,416,946., Cl. 428-421.000.
Walls, John E.; Dragon, Robert L.; and Dunder, Thomas A., 4,416,972., Cl. 430-278.000.

American Locker Security Systems, Inc.: *See—*
Chester, Richard J., 4,416,413., Cl. 232-24.000.

American Standard Inc.: *See—*
Pascoe, Robert D., 4,417,202., Cl. 324-51.000.

Ametek, Inc.: *See—*
Lea, Alfred L.; and Votta, Frank A., Jr., 4,416,162., Cl. 73-862.620.

AMP Incorporated: *See—*
Desmarais, Mark R.; and Yates, Mark A., 4,417,115., Cl. 200-340.000.
Gingerich, David J.; McCarty, Patrick R.; and Shaffer, David T., 4,417,106., Cl. 200-5.00R.
Grabbe, Dimitry G., 4,417,266., Cl. 357-80.000.
Johnson, Tore R.; and Johnson, Keith, Jr., 4,416,506., Cl. 350-96.210.
Willette, Albert D., 4,417,096., Cl. 174-71.00R.

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Carpenter, Walter L.; and Amrine, Bruce A., 4,416,280., Cl. 128-399.000.

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Anderson, Douglas B., to NCR Corporation. Data window expander circuit in a data recovery system. 4,417,286., Cl. 360-51.000.

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Fujii, Setsuro; Yasui, Bompei; Nakamura, Mitsuo; Miyamoto, Tomohisa; Ando, Kazuko; Hashimoto, Iwao; Sawai, Yoneichi; Umeda, Naoki; and Kawasaki, Masahiro, 4,416,875., Cl. 424-180.000.

Andrews Paper & Chemical Co.: *See—*
Muller, Peter; Mustacchi, Henry; and Kreicas, Leonard, 4,416,950., Cl. 428-537.000.

Angelov, Angel S.: *See—*
Nachev, Georgi N.; Angelov, Angel S.; and Petkov, Boryan I., 4,417,127., Cl. 219-124.340.

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Jacobs, Martin J., 4,416,734., Cl. 203-18.000.

Anisovich, Kliment V.; Komyak, Nikolai I.; and Menbaev, Zaurbek K., to Leningradskoe NPO "Burevestnik". X-Ray fluorescence spectrometer. 4,417,355., Cl. 378-49.000.

Antos, George J.; and Chao, Tai-Hsiang, to UOP Inc. Acidic multimetallic catalytic composite. 4,416,804., Cl. 502-213.000.

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Tokunaga, Kazuyoshi; and Anzai, Masayasu, 4,416,533., Cl. 355-4.000.

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Aoki, Keiji; and Mitsuyasu, Masaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and an apparatus for controlling the air-fuel ratio in an internal combustion engine. 4,416,237., Cl. 123-438.000.

Aoki, Susumu; Asaumi, Hiroshi; Take, Shigeo; and Akase, Masazumi, to Nippon Asbestos Company, Limited. Disc roll. 4,416,043., Cl. 29-132.000.

Apikos, Dominic A., to Atlantic Richfield Company. Metal cutting oil and method for using same. 4,416,788., Cl. 252-31.000.

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Arai, Kazutaka; Ohara, Yoshio; Takakuwa, Yasuo; and Iizumi, Toyoko, to Nissan Chemical Industries, Ltd. Process for preparing an optical active ester of naphthylpropionic acid. 4,417,070., Cl. 560-56.000.

Arai, Kenichiro, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Serial printer. 4,416,557., Cl. 400-152.000.

Archie, William A.: *See—*
Marshall, Robert M.; Archie, William A.; and Dardoufas, Kimon C., 4,416,787., Cl. 252-8.800.

Ardco, Inc.: *See—*
Niekrasz, Frank M., 4,416,086., Cl. 49-388.000.

Arena, Blaise J.; and Rohrbach, Ronald P., to UOP Inc. Support matrices and immobilized enzyme systems. 4,416,992., Cl. 435-176.000.

Argenbright, Carl T. Precision work holder for machine tools. 4,416,570., Cl. 409-222.000.

Arlt, Dieter: *See—*
Muisers, Hans-Ferdinand; Arlt, Dieter; Jautelat, Manfred; Alberts, Heinrich; and Mietzsch, Fritz, 4,417,037., Cl. 526-271.000.

Armatron International, Inc.: *See—*
Seeger, Richard E., 4,416,313., Cl. 144-193.00R.

Armco Inc.: *See—*
Pierson, Marvin B.; and Dunbar, Frank C., 4,416,920., Cl. 427-349.000.

Armstrong, Maclay M., to Northwest Orthodontics, Inc. Orthodontic spring force adjustment and disconnectible connection. 4,416,625., Cl. 433-5.000.

Arnold, Fred E.: *See—*
Reinhardt, Bruce A.; and Arnold, Fred E., 4,417,039., Cl. 526-285.000.

Asahi Glass Company Ltd.: *See—*
Sato, Kimihiko; Terase, Kunihiko; Kijimuta, Hitoshi; and Ohta, Yukinori, 4,416,863., Cl. 423-344.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kuroda, Toru; Takenaka, Yoshinori; and Tsuda, Nobuaki, 4,416,777., Cl. 210-446.000.
Nakamura, Katuyuki, 4,417,021., Cl. 524-538.000.
Noguchi, Kohji; and Kasai, Masao, 4,416,783., Cl. 210-635.000.
Shibuya, Chisei; Murakami, Masahiro; Kobayashi, Masateru; and Sone, Takanori, 4,417,047., Cl. 544-26.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Hama, Yoshihiro, 4,417,281., Cl. 358-287.000.
Iomori, Yasumasa; and Shimoda, Mituhiko, 4,416,526., Cl. 354-198.000.
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Asami, Ken: *See—*
Kubo, Seitoku; Terakura, Yukio; Nakamura, Shinya; and Asami, Ken, 4,417,307., Cl. 364-424.100.

Asami, Masahiro: *See—*
Toba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, 4,417,025., Cl. 525-54.210.

Asano, Atsushi; Takeshita, Masatoshi; Nishida, Hideki; Suzuki, Ryo; and Futami, Toshio, to Hitachi, Ltd. Bubble memory conductor pattern with heat sink. 4,417,323., Cl. 365-1.000.

Asaumi, Hiroshi: *See—*
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Asdollahi, Norbert; and Gutzmer, Christian, to Wickmann-Werke GmbH. Electrical fuse. 4,417,226., Cl. 337-273.000.

Asea AB: *See—*
Collin, Per H., 4,416,689., Cl. 75-11.000.

ASEA Aktiebolag: *See—*
Adolfsson, Morgan; Brogardh, Torgny; and Ovren, Christer, 4,417,140., Cl. 250-227.000.

Askins, William E., to Woodstream Corporation. Jaw configuration for animal trap. 4,416,081., Cl. 43-90.000.

Associated Enterprises, Inc.: *See—*
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Atlantic Richfield Company: *See—*
Apikos, Dominic A., 4,416,788., Cl. 252-31.000.
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Feucht, Klaus J.; Rossie, Egbert; and Bauer, Karl, 4,416,088., Cl. 49-502.000.

Audiau, Francois: *See—*
Le Fur, Gerard R.; and Audiau, Francois, 4,416,888., Cl. 424-267.000.

Austin, Lowell W.; and Stoddart, James O., to National Steel Corporation. Process of electroplating a nickel-zinc alloy on steel strip. 4,416,737., Cl. 204-28.000.

Australasian Training Aids Pty. Ltd.: *See—*
Knight, Lindsay C., 4,416,456., Cl. 273-359.000.

Autohaus Lorinser G.m.b.H., & Co.: *See—*
Koch, Adolf, 4,416,483., Cl. 296-37.100.

Automobiles Citroen: *See—*
Barthelemy, Andre, 4,416,345., Cl. 180-79.100.

Automobiles Peugeot: *See—*
Barthelemy, Andre, 4,416,345., Cl. 180-79.100.

Automotive Products Limited: *See*—
Osborne, Duncan W., 4,416,356., Cl. 188-326.000.
Avalon Industries, Inc.: *See*—
Berman, Mort, 4,416,632., Cl. 434-84.000.
Avenas, Pierre: *See*—
Kepes, Andre; Weynant, Eric; Avenas, Pierre; and Haudin, Jean-Marc, 4,417,041., Cl. 526-348.600.
Aversano, Ralph W. Meat preservation method. 4,416,909., Cl. 426-265.000.
Aykan, Kamran; Farrauto, Robert J.; Jefferson, Clinton F.; and Lanam, Richard D., to Engelhard Corporation. Thin film solar energy collector. 4,416,916., Cl. 427-160.000.
Azevedo, Max, to Loctite Corporation. Preapplied plastic film adhesive composition. 4,417,028., Cl. 525-285.000.
Azoian, Stepan E.: *See*—
Pelts, Boris B.; Tumasian, Beniamin A.; Egorov, Leonid P.; Zatulovsky, Lev M.; Chaikin, Peter M.; Freiman, Efim A.; Chalian, Eduard A.; Abramian, Grant I.; Azoian, Stepan E.; and Kostandian, Kliment A., 4,416,723., Cl. 156-608.000.
B & H Manufacturing Company, Inc.: *See*—
Hoffmann, Wolfgang, 4,416,714., Cl. 156-86.000.
Baba, Keikichi: *See*—
Takitani, Masaru; Baba, Keikichi; and Tomiyasu, Shizuo, 4,416,799., Cl. 502-156.000.
Bacchus, Jean-Marie: *See*—
Hugues, Edgard A.; Bacchus, Jean-Marie; and Haisma, Jan, 4,416,518., Cl. 350-427.000.
Bache, Roger J., to Gillette Company, The. Formation of coatings on cutting edges. 4,416,912., Cl. 427-13.000.
Bachman, Mark S.: *See*—
Vicino, Robert K.; and Bachman, Mark S., 4,416,073., Cl. 40-326.000.
Baethke, Friedrich W.: *See*—
Zemke, Edward H.; Guenther, Kenneth L.; and Baethke, Friedrich W., 4,416,563., Cl. 403-14.000.
Bailey, Derrick S.; and Griffin, Brian P., to Imperial Chemical Industries PLC. Pipe compositions containing anisotropic melt-forming polymers. 4,417,020., Cl. 524-502.000.
Bailey, Edmond I., to Smith International, Inc. Rotary drilling head. 4,416,340., Cl. 175-195.000.
Bailey, Martin; Hines, David A.; Ozsby, John C.; Roesler, Frank C., deceased; and by Roesler, Johanna M., executrix, to Imperial Chemical Industries PLC. Treatment of biologically-degradable waste. 4,416,781., Cl. 210-629.000.
Baker, Royce E.; and Singletary, Glennwood. Bit guidance device and method. 4,416,339., Cl. 175-61.000.
Baldoni, Viscardo, to Firestone Tire & Rubber Company, The. Tire forming drum. 4,416,720., Cl. 156-401.000.
Bale, Neville R. Solar energy collector. 4,416,257., Cl. 126-427.000.
Ball, Matthew C.; and Tomkins, Donald W., to National Research Development Corporation. Hydraulic cements. 4,416,695., Cl. 106-90.000.
Balme, Maurice: *See*—
Soula, Gerard; and Balme, Maurice, 4,417,048., Cl. 544-38.000.
Balog, Georg: *See*—
Aanerud, Lars; and Balog, Georg, 4,416,061., Cl. 29-828.000.
Balser, Donald R., to Mead Johnson & Company. Spiro-quaternary ammonium halides and N-(2-pyrimidinyl)piperazinylalkylazaspiroalkanedione process. 4,417,049., Cl. 544-231.000.
Balz, Josef: *See*—
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,416,409., Cl. 228-173.00R.
Ban, Hiroshi: *See*—
Suzuki, Kiyohisa; Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; Ban, Hiroshi; and Ishida, Nobuyasu, 4,416,361., Cl. 192-107.00M.
Banba, Toshio; Mizuno, Masanori; and Mizuno, Takaii, to Mitsubishi Denki Kabushiki Kaisha. Transistor type pulse welding device. 4,417,130., Cl. 219-130.510.
Bancalari, Jean, to Merlin Gerin. Multipole electric circuit breaker with improved current limiting device. 4,417,223., Cl. 335-195.000.
Bank of New York Inc., The, executor: *See*—
Breski, Thomas A.; and Ryan, Robert A., deceased, 4,416,653., Cl. 493-412.000.
Banno, Mitsuyuki: *See*—
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,416,235., Cl. 123-425.000.
Bapst, Urs; Keller, Heinz; Meyr, Heinrich; and Muller, Hans R., to International Business Machines Corp. Method for connecting or disconnecting selected stations in a ring communication system, and ring communication system including selectively connectable stations. 4,417,242., Cl. 340-825.050.
Barcza, Sandor; and Kathawala, Faizulla G., to Sandoz, Inc. Para-amino benzoic and phenylacetic acid derivatives. 4,416,876., Cl. 424-184.000.
Barisoff, Leonard M. Blowpipe type of burner. 4,416,613., Cl. 431-243.000.
Barkhoudarian, Sarkis, to Rockwell International Corporation. Method and apparatus for measuring torque. 4,416,161., Cl. 73-862.360.
Barrat, Christian R.; Walker, John R.; and Wevers, Jean, to Procter & Gamble Company, The. Liquid detergent compositions containing amino-silanes. 4,416,793., Cl. 252-117.000.
Barrat, Christian R.; Walker, John R.; and Wevers, Jean, to Procter & Gamble Company, The. Rinse aid compositions containing amino-silanes. 4,416,794., Cl. 252-174.150.
Barratt, Robert O.; and Franklin, Howard N., to Foster Wheeler Energy Corporation. Heat exchanger. 4,416,325., Cl. 165-47.000.
Barsotti, Robert J., to Du Pont de Nemours, E. I., and Company. Additive for coating compositions of silica and a fluorinated ethylene oxide polymer. 4,416,941., Cl. 428-328.000.
Barthelemy, Andre, to Automobiles Citroen; and Automobiles Peugeot. Rotary assistance mechanisms, more especially for vehicle steering. 4,416,345., Cl. 180-79.100.
Bascom, Laurence N.; and Leung, Peter S. K., to Du Pont de Nemours, E. I., and Company. Bulked extensible weft yarn suitable for use as tire cords. 4,416,935., Cl. 428-229.000.
BASF Aktiengesellschaft: *See*—
Oeder, Dieter; Dietsche, Wolfram; Weiss, Stefan; Ziegler, Walter; Kueppers, Peter; and Hetiche, Albert, 4,417,035., Cl. 526-208.000.
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BASF Farben & Fasern AG: *See*—
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Baski, Henry A. Pitless adapter. 4,416,328., Cl. 166-65.00R.
Batchelder, David N.: *See*—
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Bateika, Gediminas, to Pfaff Haushaltmaschinen GmbH. Circuit for controlling the speed of a motor. 4,417,187., Cl. 318-331.000.
Bates, Richard L.: *See*—
D'Antonio, Joseph V., 4,416,387., Cl. 220-93.000.
Battista, Orlando A. Protein polymer hydrogels. 4,416,814., Cl. 260-117.000.
Baty, Charlton R.: *See*—
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Batzill, Wolfgang; and Diefenbach, Horst, to BASF Farben & Fasern AG. Process for electrocoating an electrically conductive substrate. 4,416,753., Cl. 204-181.00C.
Baucom, Robert M., to United States of America, National Aeronautics and Space Administration. Medical clip. 4,416,266., Cl. 128-325.000.
Bauer, Karl: *See*—
Feucht, Klaus J.; Rossie, Egbert; and Bauer, Karl, 4,416,088., Cl. 49-502.000.
Bauer, Ronald E. Illuminated cake decoration. 4,416,075., Cl. 40-546.000.
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Baxter Travenol Laboratories, Inc.: *See*—
Cromie, Harry W., 4,416,595., Cl. 417-476.000.
Bayer Aktiengesellschaft: *See*—
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Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,416,832., Cl. 260-940.000.
Lindner, Christian; Binsack, Rudolf; Rempel, Dieter; and Ott, Karl-Heinz, 4,417,026., Cl. 525-64.000.
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,416,870., Cl. 424-172.000.
Muisers, Hans-Ferdinand; Arlt, Dieter; Jautelat, Manfred; Alberts, Heinrich; and Mietzsch, Fritz, 4,417,037., Cl. 526-271.000.
Nolte, Wilfried; and Esser, Heinz, 4,417,036., Cl. 526-211.000.
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BBC Brown, Boveri & Company Limited: *See*—
Albrecht, Joachim; Duerig, Thomas; Mercier, Olivier; and Weber, Walter, 4,416,706., Cl. 148-11.50C.
Menth, Anton; and Stucki, Samuel, 4,416,747., Cl. 204-129.000.
Beach, Daryl R. Dental practice means. 4,416,634., Cl. 434-263.000.
Beall, George H.; and Fehlner, Francis P., to Corning Glass Works. Electrochromic devices including a mica layer electrolyte. 4,416,517., Cl. 350-357.000.
Beall, Robert. Compartmented container. 4,416,370., Cl. 206-217.000.
Beazley, William W. Orthodontic appliance. 4,416,627., Cl. 433-18.000.
Bechtel International Corporation: *See*—
Taylor, Allan D., 4,416,774., Cl. 210-236.000.
Beck, Siegfried; and Urescher, Philipp, to Drescher GmbH & Co. KG. Device for obtaining accurate registration of handwritten impressions on continuous business form sets. 4,416,470., Cl. 281-7.000.
Beck, Wilfried; and Kauschus, Fritz, to Agfa-Gevaert Aktiengesellschaft. Apparatus and a method for removing thickened borders after the coating of webs. 4,416,918., Cl. 427-296.000.
Beck, Wilfried, to Agfa-Gevaert Aktiengesellschaft. Method and an apparatus for removing thickenings in coatings occurring transversely to the direction of travel of the web. 4,416,919., Cl. 427-296.000.
Becker, Udo; Schaich, Eugen; and Weigert, Manfred, to Boehringer Mannheim GmbH. Method of preparing tissue thromboplastin. 4,416,812., Cl. 260-112.00R.
Becton Dickinson and Company: *See*—
Kaufman, Joseph, 4,416,291., Cl. 128-766.000.
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Beecham Group Limited: *See*—
Bentley, Peter H., 4,416,883., Cl. 424-250.000.

Behncke, Hahns-Jurgen. Multi-story elevator-type garage. 4,416,578., Cl. 414-249.000.

Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Bleckmann, Hans-Wilhelm; and Weise, Lutz, to ITT Industries, Inc. Pressure controlling arrangement for use in a vehicle brake system. 4,416,491., Cl. 303-113.000.

Bell & Howell Company: *See*—
Zemke, Edward H.; Guenther, Kenneth L.; and Baethke, Friedrich W., 4,416,563., Cl. 403-14.000.

Bell Telephone Laboratories, Incorporated: *See*—
Abbruscato, Charles R., 4,417,348., Cl. 375-40.000.
Allen, Jonathan B., 4,417,102., Cl. 364-513.000.
Beni, Gerardo; and Schiavone, Lawrence M., 4,416,516., Cl. 350-357.000.
Favin, David L.; Lynn, Peter F.; and Snyder, Paul J., 4,417,337., Cl. 371-22.000.
Keller, Jack K.; and Mowery, Gilbert L., Jr., 4,417,162., Cl. 307-473.000.

Bell, William R.: *See*—
Rhodes, Buck A.; and Bell, William R., 4,416,865., Cl. 924-1.100.

Bellavia, William D. Method for recapturing anterior displaced mandibular disc and orthopedic device therefor. 4,416,626., Cl. 433-7.000.

Belli, Remo D.: *See*—
Hartry, Donald R.; and Belli, Remo D., 4,416,181., Cl. 84-272.000.

Bellina, Joseph H. Signal balloon dispensing apparatus. 4,416,433., Cl. 244-33.000.

Bellis, Robert D.; and Wood, Dennis, to Coin Controls Limited. Coin validating arrangement. 4,416,364., Cl. 194-100.00A.

Bellus, Daniel: *See*—
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,417,058., Cl. 548-451.000.

Belov, Petr S.: *See*—
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,417,076., Cl. 568-361.000.

Bemis Manufacturing Company: *See*—
Otte, Timothy J., 4,416,048., Cl. 29-526.00R.

Bender, Ernest S.; Ignasiak, Marty C.; and Jones, Michael H., to Associated Enterprises, Inc. Universal molding system and method. 4,416,604., Cl. 425-183.000.

Bender, Richard E.: *See*—
Tanner, Curtis J.; Bender, Richard E.; Simson, Anton K.; and McCutchen, Hugh, Jr., 4,416,329., Cl. 166-68.000.

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Frascatore, John F.; Nelson, Dean R.; and Marsh, Edward K., 4,416,499., Cl. 339-92.00M.
Lanterman, Beryl A., 4,417,238., Cl. 340-688.000.
Reddy, Junuthula N., 4,417,201., Cl. 123-490.000.
Taft, Darwin O.; and Van Siclen, Howard E., Jr., 4,416,245., Cl. 123-613.000.
Warren, Gilbert G., 4,416,745., Cl. 204-112.000.
Weilbacker, Thomas O., 4,417,336., Cl. 371-20.000.

Benedikt, Walter; Latsch, Reinhard; and Schlembach, Hans, to Robert Bosch GmbH. Separately ignited internal combustion engine with at least one main combustion chamber and an ignition chamber. 4,416,228., Cl. 123-268.000.

Benedite, Claude; Lafaye, Marcel; Lenfant, Jean-Pierre; and Reynier, Jacques, to Claude Benedite Laser Techniques Saint-Cyr. Process and installation for machining by radiation a composite part. 4,417,124., Cl. 219-121.0LH.

Beni, Gerardo; and Schiavone, Lawrence M., to Bell Telephone Laboratories, Incorporated. Matrix addressable electrochromic devices. 4,416,516., Cl. 350-357.000.

Benincasa, Timothy C., to Imperial Clevite Inc. Flexible circuit interconnect for piezoelectric element. 4,417,170., Cl. 310-345.000.

Bennett, Matthew C.; and Strange, Donald R., to Medtronic, Inc. Video to digital converter. 4,417,276., Cl. 358-160.000.

Bennett, Peter H. E., to Chartwell House Group Limited, The. Centrifuges and centrifuge cleaning methods. 4,416,655., Cl. 494-40.000.

Bentley, Peter H., to Beecham Group Limited. Penicillin derivatives. 4,416,883., Cl. 424-250.000.

Bentzen, Craig L.; Mong, Lan N.; and Niesor, Eric, to Symphar S.A. Anti-atherosclerotic pharmaceutical compositions containing diphosphonate compounds. 4,416,877., Cl. 424-204.000.

Benz, Gunter: *See*—
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,416,870., Cl. 424-172.000.

Beppu, Tatsuro: *See*—
Iwamoto, Masami; Tashiro, Makoto; Beppu, Tatsuro; and Kasami, Akinobu, 4,417,262., Cl. 357-17.000.

Berchem, Antoine: *See*—
Sudan, Krishan K.; and Berchem, Antoine, 4,417,004., Cl. 521-181.000.

Berford, Saint Elmo B.: *See*—
Guerrero, Benjamin G.; and Berford, Saint Elmo B., 4,416,074., Cl. 40-364.000.

Berghammer, Conrad; Schafer, Walter; and Stuhler, Rolf, to Braun Aktiengesellschaft. Electrical ignition system for catalytically heated curling device. 4,416,298., Cl. 132-33.00R.

Bergles, Eduard, to Fichtel & Sachs AG. Bicycle chain-shifting device. 4,416,646., Cl. 474-80.000.

Berglund, Rickey T. Abdominal catheter implant. 4,416,657., Cl. 604-9.000.

Bergman, Carl A.; Thomas, Roy L.; and Bourbeau, Richard A., to Standard Duplicating Machines Corp. Sheet binding. 4,416,722., Cl. 156-578.000.

Bergman, Charles T., to Brandt, Inc. Coin loader. 4,416,299., Cl. 133-1.00R.

Bergqvist, Bengt: *See*—
Skogstrom, Lars; and Bergqvist, Bengt, 4,416,259., Cl. 126-429.000.

Berke, Herbert, to United States of America, Navy. Linearizing circuit for a high frequency voltage controlled oscillator. 4,417,218., Cl. 331-178.000.

Berkowitz, Ami E.; and Walter, John L., to General Electric Co. Process for producing a ferrofluid. 4,416,751., Cl. 204-165.000.

Berman, Mort, to Avalon Industries, Inc. Paint-by-numbers kit. 4,416,632., Cl. 434-84.000.

Bernard, Jean-Rene; and Breysse, Michele, to Elf France. Catalyst for production of aromatic hydrocarbons and process for preparation. 4,416,806., Cl. 502-74.000.

Bernard, Jean-Rene; and Breysse, Michele, to Elf France. Process for the dehydrocyclization of paraffins at low pressure. 4,417,083., Cl. 585-419.000.

Bernstein, Joel E., to Dermall Limited. Method of treating pruritis and composition therefor. 4,416,886., Cl. 424-260.000.

Berry, Richard E.; and Wilson, John H., to International Business Machines Corporation. Report generation control system for text processing machines. 4,417,322., Cl. 364-900.000.

Berstis, Viktors, to International Business Machines Corporation. Method for evaluating boolean expressions. 4,417,305., Cl. 364-300.000.

Bertling, Hannes; and Leiber, Heinz, to Robert Bosch GmbH. Apparatus for propulsion control in a motor vehicle having an anti-locking system. 4,416,347., Cl. 180-197.000.

Bertolacini, Ralph J.: *See*—
Udovich, Carl A.; Hirschberg, Eugene H.; and Bertolacini, Ralph J., 4,416,803., Cl. 502-209.000.

Best, David W., to Rockwell International Corporation. Parallel operating mode arithmetic logic unit apparatus. 4,417,314., Cl. 364-716.000.

Best, David W., to Rockwell International Corporation. Digital binary increment circuit apparatus. 4,417,316., Cl. 364-770.000.

Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, to Degussa Aktiengesellschaft. Process for the resolution of the racemate (1RS,2SR)-2-amino-1-phenyl-propan-1-ol. 4,416,827., Cl. 260-501.120.

Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, to Degussa Aktiengesellschaft. Process for the resolution of the racemate S-(carboxymethyl)-(RS)-cysteine (A). 4,416,828., Cl. 260-501.120.

Bethlehem Apparatus Company, Inc.: *See*—
Lawrence, James B.; and Lawrence, Bruce J., 4,416,382., Cl. 215-231.000.

Bettner, Timothy J.; Sullivan, Frank E.; and Hartley, Croydon R., to Northrop Corporation. Composite laminating method and product. 4,416,175., Cl. 83-29.000.

Beun, Roger A., to Northern Telecom Limited. Support member for electronic devices. 4,417,095., Cl. 174-52.0FP.

Beyerle, Rudi: *See*—
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,416,893., Cl. 424-272.000.

BFG GLASSGROUP: *See*—
Derner, Paul; and Mertin, Dietrich, 4,416,101., Cl. 52-398.000.

Bhargava, Hemendra N.: *See*—
Walter, Roderich W.; Krivoy, William A.; Ritzmann, Ronald F.; and Bhargava, Hemendra N., 4,416,871., Cl. 424-177.000.

Bialobrzeski, Walter; and Sperry, Paul A. Child-proof latch. 4,416,477., Cl. 292-19.000.

BICC Public Limited Company: *See*—
Dey, Phillip; Fearns, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., 4,416,508., Cl. 350-96.230.

Billet, Rene; and Renaud, Pierre, to Valeo. Hub and web assembly. 4,416,564., Cl. 403-282.000.

Binsack, Rudolf: *See*—
Lindner, Christian; Binsack, Rudolf; Rempel, Dieter; and Ott, Karl-Heinz, 4,417,026., Cl. 525-64.000.

Bittler, Dieter: *See*—
Petzoldt, Karl; Wiechert, Rudolf; Laurent, Henry; Nickisch, Klaus; and Bittler, Dieter, 4,416,985., Cl. 435-58.000.

Bjurling, Anders, to Dynatrans AB. Tank container with mounting means. 4,416,384., Cl. 220-1.500.

Blach, Josef A. Device for mixing, dispersing and homogenizing compounds with at least one viscous component. 4,416,544., Cl. 366-85.000.

Black, Daniel A., to Textron Inc. Collapsible fastener with plastic sleeve. 4,416,572., Cl. 411-38.000.

Black, Jerimiah B. Microwave water heating method and apparatus. 4,417,116., Cl. 219-10.55A.

Blackstone, Paul C., to Lever Brothers Company. Iminodipropionate containing detergent compositions. 4,416,792., Cl. 252-110.000.

Blank, Charles J., Jr. Apparatus for removing and transporting ashes. 4,416,252., Cl. 126-242.000.

Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., to Hoechst Aktiengesellschaft. Bis-betaine-amine oxides, process for their preparation, and cleaning agents containing them. 4,416,808., Cl. 252-547.000.

Blawert, Dieter: *See—*
Knothe, Erich; Blawert, Dieter; and Schubart, Bernd, 4,416,343., Cl. 177-180.000.

Bleckmann, Hans-Wilhelm: *See—*
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Bleckmann, Hans-Wilhelm; and Weise, Lutz, 4,416,491., Cl. 303-113.000.

Bloom, Terry R., to CTS Corporation. Vertical tunnel kiln. 4,416,624., Cl. 432-134.000.

Boardman, Craig W.: *See—*
Fouroux, Claude H.; and Boardman, Craig W., 4,416,143., Cl. 72-479.000.

Boberg, Michael; and Metzger, Karl G., to Bayer Aktiengesellschaft. β-Lactam antibiotics and compositions containing the same. 4,416,880., Cl. 424-246.000.

Bochskandl, Margarete, to American Frometics, Inc. Process for prolonging the shelf life of cosmetics. 4,416,901., Cl. 424-363.000.

Boda, James, to Brunswick Corporation. Connector for vane steering of marine drive. 4,416,636., Cl. 440-51.000.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See—*
Huber, Bernhard, 4,416,736., Cl. 204-1.00T.

Bodkin, Robert E.: *See—*
Rosen, Howard N.; Bodkin, Robert E.; and Gaddis, Kenneth D., 4,416,069., Cl. 34-13.800.

Bodmer, Albert, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. Reflector for uniformly illuminating an area, particularly a film window of a film or slide projector, and reflector lamp. 4,417,300., Cl. 362-304.000.

Boeckmann, Hugo: *See—*
Scheffers, Richard W.; and Boeckmann, Hugo, 4,416,376., Cl. 206-554.000.

Boehringer Mannheim GmbH: *See—*
Becker, Udo; Schaich, Eugen; and Weigert, Manfred, 4,416,812., Cl. 260-112.00R.
Roder, Albert; Siedel, Joachim; Mollering, Hans; Seidel, Hans; and Gauhl, Helmgard, 4,416,983., Cl. 435-25.000.

Boeing Company, The: *See—*
Alberti, John, 4,416,579., Cl. 414-534.000.
Faville, Paul E., 4,417,147., Cl. 250-560.000.
Herrmann, Richard, Jr., 4,416,738., Cl. 204-32.00R.
Jacobs, Loyd D., 4,416,349., Cl. 181-208.000.

Bogan, William F.: *See—*
Kulischenko, Walter; Bogan, William F.; and Ellis, William C., 4,416,644., Cl. 464-52.000.

Bogorsky, Mikhail V.: *See—*
Kuchuk-Yatsenko, Sergei I.; Bogorsky, Mikhail V.; and Samotryasov, Sergei M., 4,417,121., Cl. 219-104.000.

Bohm, Roland; and Hille, Martin, to Hoechst Aktiengesellschaft. Emulsion-breaking composition. 4,416,796., Cl. 252-338.000.

Bohn, Helmut: *See—*
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,416,893., Cl. 424-272.000.

Bohnert, Jozsef: *See—*
Szebenyi, Ferenc; Nemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, 4,416,566., Cl. 405-291.000.

Boliden Aktiebolag: *See—*
Malmqvist, Erik L.; and Kristiansson, Krister, 4,417,142., Cl. 250-253.000.

Bolt, Lawrence, to American Hoechst Corporation. High stability polarizer. 4,416,946., Cl. 428-421.000.

Bomar Corporation: *See—*
Lybecker, Robert W.; Senghaas, Karl A.; and Olafson, James W., 4,416,085., Cl. 49-340.000.

Bone, Arnold R., to Dennison Manufacturing Company. Dispensing of fasteners with a pivoted and disengageable feed mechanism. 4,416,407., Cl. 227-67.000.

Borghese, Valerio; Erratico, Pietro; and Coccetti, Silvano, to SGS-ATES Componenti Elettronici SpA. Power amplifier protection circuit. 4,417,292., Cl. 361-87.000.

Borror, Alan L.; Cincotta, Louis; and Lee, John W., Jr., to Polaroid Corporation. Novel xanthene compounds and their photographic use. 4,416,971., Cl. 430-221.000.

Borruso, Marty: *See—*
Goodman, Mark; Zeno, John R.; and Borruso, Marty, 4,416,145., Cl. 73-40.50A.

Bortnik, Michael: *See—*
Menke, Russell O.; and Bortnik, Michael, 4,416,785., Cl. 210-699.000.

Bosne, Jacques G. P. E., to Hamon-Sobelco, S.A. Device for receiving a free falling liquid and the application thereof in a countercurrent liquid and gas cooling device. 4,416,835., Cl. 261-110.000.

Bottger, Diether, to Eglasstrek Patent Promotion & Awarding GmbH. Method and apparatus for making glass filament or fibers. 4,416,678., Cl. 65-2.000.

Bouillon, Alain M. Potato harvesting apparatus. 4,416,334., Cl. 171-27.000.

Bourbeau, Richard A.: *See—*
Bergman, Carl A.; Thomas, Roy L.; and Bourbeau, Richard A., 4,416,722., Cl. 156-578.000.

Bouteille, Rene: *See—*
Gabellieri, Rodolfo; and Bouteille, Rene, 4,416,949., Cl. 428-461.000.

Bouvard, Andre: *See—*
Hulin, Jean P.; Bouvard, Andre; and Le Maitre, Patrick, 4,416,507., Cl. 350-96.220.

Bowald, Staffan: *See—*
Eriksson, Ingvar; Bowald, Staffan; and Busch, Christer, 4,416,028., Cl. 3-1.400.

Bowditch, W. Raymond, to Wilmington Chemical Corporation. Diglycidyl ether of dimethanol cyclohexane and reaction products thereof. 4,417,033., Cl. 525-481.000.

Bowen, Theodore: *See—*
Hessemer, Robert A., Jr.; and Perper, Lloyd J., 4,416,552., Cl. 374-117.000.

Bower, James F. Flexible one-way valve and method of producing. 4,416,308., Cl. 137-846.000.

Bowman, Harold M.; and Kicher, Thomas P., to Bowman, Harold M. Ingot mold and method. 4,416,440., Cl. 249-82.000.

Braas & Company GmbH: *See—*
Bugener, Franz; Rinklake, Manfred; Horch, Werner; Rottger, Wilhelm; Jost, Gunter; and Kirsch, Johann, 4,416,094., Cl. 52-72.000.

Brachert, Heinrich: *See—*
Monch, Joachim; and Brachert, Heinrich, 4,416,712., Cl. 149-98.000.

Bradford-White Corportion: *See—*
Staats, Charles W., 4,416,222., Cl. 122-13.00R.

Bradley, Harry S., to H. & K. Bradley (Trailer Equipment) Limited. Towing couplings. 4,416,467., Cl. 280-512.000.

Braggins, Timothy T.: *See—*
Thomas, Richard N.; and Braggins, Timothy T., 4,416,051., Cl. 29-572.000.

Brand, Erich: *See—*
Schurmann, Helmut; and Brand, Erich, 4,416,790., Cl. 252-62.000.

Brandes, Wilhelm: *See—*
Stetter, Jorg; Lunkenheimer, Winfried; and Brandes, Wilhelm, 4,416,889., Cl. 424-269.000.

Brandsness, Gordon T.; Ebright, Robert L.; and Orosz, Alexander J., to Sperry Corporation. Spring clip electrical connector for strip conductor cable. 4,416,497., Cl. 339-17.00F.

Brandt, Inc.: *See—*
Bergman, Charles T., 4,416,299., Cl. 133-1.00R.

Brandt, Timothy B.: *See—*
Parr, Erwin W.; and Brandt, Timothy B., 4,416,399., Cl. 222-402.130.

Braun Aktiengesellschaft: *See—*
Berghammer, Conrad; Schafer, Walter; and Stuhler, Rolf, 4,416,298., Cl. 132-33.00R.

Braun, Ernst; and Braun, Gert, to Halbach & Braun. Planar drive device. 4,416,643., Cl. 464-38.000.

Braun, Gert: *See—*
Braun, Ernst; and Braun, Gert, 4,416,643., Cl. 464-38.000.

Braverman, Milton; and Zink, Leonard, to Medi-Dose, Inc. Computer print form cover sheet for multi-compartment medicinal dispensing device. 4,416,375., Cl. 206-534.100.

Brefka, Paul E. Edge anchors for printed circuit board connectors. 4,416,496., Cl. 339-17.00C.

Breski, Thomas A.; and Ryan, Robert A., deceased (by Bank of New York Inc., The, executor), to International Business Machines Corporation. Apparatus for stacking fan-folded paper. 4,416,653., Cl. 493-412.000.

Breslau, Steven M.; and Grossman, M. Gary, to Sima Products Corporation. Camera lens accessory mounting construction. 4,416,528., Cl. 354-296.000.

Bresler, Robert G., to McCormick Laboratories, Inc. Circuits for determining very accurately the position of a device inside biological tissue. 4,416,289., Cl. 128-737.000.

Bresson, Clarence R.; and Parlman, Robert M., to Phillips Petroleum Company. Selective mineral recovery. 4,416,770., Cl. 209-167.000.

Breysse, Michele: *See—*
Bernard, Jean-Rene; and Breysse, Michele, 4,416,806., Cl. 502-74.000.
Bernard, Jean-Rene; and Breysse, Michele, 4,417,083., Cl. 585-419.000.

Brinkmann, Heinz, to Hermann Berstorff Maschinesbau GmbH. Apparatus for treating powdery rubber mixtures. 4,416,543., Cl. 366-80.000.

Brister, Beryle D. Method and apparatus for controlling the formation of a temporary plug in a fluid transmission line. 4,416,118., Cl. 62-66.000.

Bristol-Myers Company: *See—*
Kaplan, Murray A.; and Shinal, Edward C., 4,416,874., Cl. 424-177.000.

Britax (Wingard) Limited: *See—*
Cunningham, Douglas J., 4,416,468., Cl. 280-802.000.
Cunningham, Douglas J.; and Sanders, George G., 4,416,469., Cl. 280-804.000.

Brodsky, Eric L.: *See—*
Klus, John P.; Gibboss, Everett E.; Brodsky, Eric L.; and Janule, Victor P., 4,416,148., Cl. 73-64.400.

Brogardh, Torgny: *See—*
Adolfsson, Morgan; Brogardh, Torgny; and Ovren, Christer, 4,417,140., Cl. 250-227.000.

Brois, Stanley J.; and Gutierrez, Antonio, to Exxon Research & Engineering Co. Thio-bis-(alkyl lactone acid esters) and thio-bis-(hydrocarbyl diacid esters) are useful additives for lubricating compositions. 4,417,062., Cl. 549-320.000.

Bronx-Lebanon Hospital Center: *See—*
Amaral, Leonard, 4,416,995., Cl. 435-291.000.

Brooks, Ronald H. Method and apparatus for joining abutting edges of sheet material. 4,416,713., Cl. 156-64.000.

Brossard, Pierre; and Duponteil, Daniel. Phase displacement modulator. 4,417,219., Cl. 332-9.00R.

Brower, Jerome S. Underwater cutting rod. 4,416,444., Cl. 266-48.000.

Brown, Boveri & Co. Aktiengesellschaft: *See*—
Schmitt, Herrmann; Sellner, Rudolf; and Greefe, Klaus, 4,417,222., Cl. 335-6.000.

Brown Boveri Electric Inc.: *See*—
Spencer, Edward M., 4,417,094., Cl. 174-28.000.

Brown, Dennis N. Method and apparatus for determining the neutral axis of a foot or the like. 4,416,292., Cl. 128-779.000.

Brown, Edgar D., Jr., to General Electric Company. Method of preparing β-phenylethylchlorosilanes. 4,417,069., Cl. 556-479.000.

Brown, Frank E. Tamperproof metering dispenser. 4,416,397., Cl. 222-219.000.

Brown, Glenn E.; Karpetsky, Timothy P.; and Jewett, Phillip, to United States of America, Health and Human Services. Multi slab gel casting electrophoresis apparatus. 4,416,761., Cl. 204-299.00R.

Brown, Lloyd C.; and Klasen, Rudi, to GA Technologies Inc. Countercurrent solids-fluid contactor. 4,416,859., Cl. 422-261.000.

Brown, Terence J.: *See*—
Shutt, Joseph A.; Tutt, Kingsley J.; Tillyard, Malcolm; and Brown, Terence J., 4,416,031., Cl. 12-127.000.

Browning Engineering Corporation: *See*—
Browning, James A., 4,416,421., Cl. 239-79.000.

Browning, James A., to Browning Engineering Corporation. Highly concentrated supersonic liquified material flame spray method and apparatus. 4,416,421., Cl. 239-79.000.

Brumm, Richard S., to Grove Valve and Regulator Company. Annular piston valve. 4,416,301., Cl. 137-220.000.

Brundidge, Larry G. Oil filter construction. 4,416,776., Cl. 210-238.000.

Bruning, Rolf; and Habegger, Friedhelm, to Heraeus Quarzschmelze GmbH. Method of making quartz glass crucibles, and apparatus carrying out the method. 4,416,680., Cl. 65-144.000.

Brunswick Corporation: *See*—
Boda, James, 4,416,636., Cl. 440-51.000.

Buddy B. Simpson A/B Electronics: *See*—
Kirby, Raymond L., 4,416,155., Cl. 73-646.000.

Budzich, Tadeusz, to Caterpillar Tractor Co. Fully compensated fluid control valve. 4,416,189., Cl. 91-421.000.

Budzich, Tadeusz, to Caterpillar Tractor Co. Fully compensated fluid control valve. 4,416,304., Cl. 137-596.130.

Buecheler, Paul, to Sandoz Ltd. Phthaloperinone dyes and the use thereof for more dyeing plastics. 4,417,014., Cl. 524-90.000.

Bugener, Franz; Rinklake, Manfred; Horch, Werner; Rottger, Wilhelm; Jost, Gunter; and Kirsch, Johann, to Braas & Company GmbH. Attic window assembly. 4,416,094., Cl. 52-72.000.

Buhler, Arthur: *See*—
Schutz, Hans U.; and Buhler, Arthur, 4,416,815., Cl. 260-145.00A.

Buljan, Sergej-Tomislav: *See*—
Sarin, Vinod K.; Buljan, Sergej-Tomislav; and D'Angelo, Charles, 4,416,670., Cl. 51-295.000.

Bullat, Jean, to Somfy. Driving system for roll-up shades, blinds, rolling shutters and the like. 4,417,185., Cl. 318-2.000.

Bulso, Joseph D., Jr.; and Lewers, William R., to Redicon Corporation. Can removal method for use with a double action cupper. 4,416,140., Cl. 72-345.000.

Burch, Glen R. Process for extracting gold, silver, platinum, lead, or manganese metals from ore. 4,416,692., Cl. 75-63.000.

Burgdorf, Jochen: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Bleckmann, Hans-Wilhelm; and Weise, Lutz, 4,416,491., Cl. 303-113.000.

Burke, Francis P., to Conoco Inc. Method and apparatus for deashing coal liquefaction effluents. 4,416,424., Cl. 241-101.00B.

Burns, Edward P., to Nabisco Brands, Inc. Display and dispensing carton. 4,416,369., Cl. 206-45.290.

Burns, Robert B.: *See*—
McMahon, Matthew A.; Wilson, Raymond F.; Eng, King D.; and Burns, Robert B., 4,416,674., Cl. 55-485.000.

Burow, Kenneth W., Jr., to Eli Lilly and Company. Benzamides, compositions and agricultural method. 4,416,683., Cl. 71-90.000.

Burroughs Corporation: *See*—
Cantarella, Robert G., 4,417,339., Cl. 371-37.000.
Grow, Robert M., 4,417,243., Cl. 340-825.050.
Hazel, Robert L.; and LaBudde, Edward V., 4,417,330., Cl. 369-32.000.
Ragle, Herbert U.; and DeMoss, Dean, 4,417,289., Cl. 360-98.000.

Burroughs Wellcome Co.: *See*—
Thorogood, Peter B., 4,416,895., Cl. 424-273.00R.

Burton, Clement: *See*—
Kirchen, Michel; Solvi, Marc; and Burton, Clement, 4,416,673., Cl. 55-267.000.

Busch, Christer: *See*—
Eriksson, Ingvar; Bowald, Staffan; and Busch, Christer, 4,416,028., Cl. 3-1.400.

Butler, James R.: *See*—
Watson, James M.; Forward, Cleve H.; and Butler, James R., 4,417,085., Cl. 585-440.000.

Butterworth, Arthur L.: *See*—
Eber, David H.; and Butterworth, Arthur L., 4,416,597., Cl. 418-55.000.

Byrns, Edson H., to Carrier Corporation. Centrifugal vapor compressor. 4,416,583., Cl. 415-148.000.

C. A. Weidmuller GmbH & Co.: *See*—
Stenz, Paul, 4,416,500., Cl. 339-95.00D.

C. Ed. Schulte GmbH: *See*—
Steinbrink, Wilfried, 4,416,128., Cl. 70-364.00A.

Cabane, Bruno; and Galzy, Pierre, to PCUK - Produits Chimiques Ugine Kuhlmann. Method of synthesizing proteins from methanol. 4,416,987., Cl. 435-68.000.

Cadbury Schweppes Transport Services Ltd.: *See*—
Constantine, Albert B.; and Walker, Alan D., 4,416,225., Cl. 123-25.00E.

Cailliouet, Jerome P. Camera body tie down and quick release device. 4,416,405., Cl. 224-257.000.

Cammack, Michael A.; Elkins, Christopher W.; Hickman, Clarence J.; and Mullins, Keith M., to Teledyne Industries, Inc. Push-button switch as used in oral hygiene appliance. 4,416,628., Cl. 433-80.000.

Campbell, J. Allan, to Upjohn Company, The. 17β-Difluoromethyl steroids. 4,416,822., Cl. 260-397.400.

Canada Thermofilm Limited: *See*—
Carl, Douglas E., 4,417,131., Cl. 219-279.000.

Canney, Robert S., to General Electric Co. Tamper deterent seal providing indication of tampering for watthour meters. 4,416,478., Cl. 292-307.00R.

Canon Kabushiki Kaisha: *See*—
Kawabata, Takashi, 4,416,523., Cl. 354-25.000.
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,416,962., Cl. 430-65.000.
Sugitani, Hiroshi, 4,417,251., Cl. 346-1.100.

Cantarella, Robert G., to Burroughs Corporation. Fault tolerant error correction circuit. 4,417,339., Cl. 371-37.000.

Canup, Robert E., to Texaco Inc. Internal combustion engine with fuel injection and AC type high tension spark. 4,416,246., Cl. 123-618.000.

Caretta, Renato, to Societa' Pneumatici Pirelli S.p.A. Pneumatic tire for motor vehicles having a tread pattern which adapts the tire for good performance and low road noise. 4,416,317., Cl. 152-209.00R.

Carl, Douglas E., to Canada Thermofilm Limited. Alternative heating apparatus for use in a heating system having a fuel burner, particularly a forced-air central heating system. 4,417,131., Cl. 219-279.000.

Carl, Heinz. Cover structure. 4,416,928., Cl. 428-38.000.

Carlingswitch, Inc.: *See*—
Sorenson, Richard W., 4,417,109., Cl. 200-68.000.

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Byrns, Edson H., 4,416,583., Cl. 415-148.000.

Carson Products Company: *See*—
Meyers, William E., 4,416,296., Cl. 132-7.000.

Casio Computer Co., Ltd.: *See*—
Ishida, Hideaki, 4,416,178., Cl. 84-1.190.

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Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,416,893., Cl. 424-272.000.
Tappe, Horst; and Roth, Kurt, 4,416,665., Cl. 8-464.000.

Caterpillar Tractor Co.: *See*—
Budzich, Tadeusz, 4,416,189., Cl. 91-421.000.
Budzich, Tadeusz, 4,416,304., Cl. 137-596.130.

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Mueller, Peter F.; and Caulfield, H. John, 4,416,538., Cl. 355-67.000.

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Foley, Paul, 4,416,823., Cl. 260-410.90R.
Peterson, Howell L.; and McMahon, Paul E., 4,416,924., Cl. 427-388.100.
Shimp, David A., 4,417,010., Cl. 523-466.000.

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Owsen, Paul J., 4,416,174., Cl. 82-38.00R.

Chaikin, Peter M.: *See*—
Pelts, Boris B.; Tumasian, Beniamin A.; Egorov, Leonid P.; Zatulovsky, Lev M.; Chaikin, Peter M.; Freiman, Efim A.; Chalian, Eduard A.; Abramian, Grant I.; Azoian, Stepan E.; and Kostandian, Kliment A., 4,416,723., Cl. 156-608.000.

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Dore, Charles F. G.; and Chambers, Geoffrey R., 4,416,662., Cl. 604-154.000.

Champion International Corporation: *See*—
Gibson, Donald B.; and Laughinghouse, Gerald F., 4,416,170., Cl. 76-107.00R.

Sullivan, John; and Lillibridge, Harold R., 4,416,651., Cl. 493-12.000.
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Chan, Kowk Y., to W. Haking Esterprises Limited. Autorewinding self-threading camera. 4,416,525., Cl. 354-173.000.
Chang, Philip Y.; and Hoffman, Virginia M., to International Business Machines Corp. Qualifying and sorting file record data. 4,417,321., Cl. 364-900.000.
Chang, Wen-Hsuan; O'Dwyer, James B.; and Peffer, John R., to PPG Industries, Inc. Coating compositions based on polyol-containing film forming components and organic alcoholic reactive diluents. 4,417,022., Cl. 524-598.000.
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Antos, George J.; and Chao, Tai-Hsiang, 4,416,804., Cl. 502-213.000.
Chaplin, George B. B.; Powell, Andrew R.; and Smith, Roderick A., to Sound Attenuators Limited. Method of reducing the adaption time in the cancellation of repetitive vibration. 4,417,098., Cl. 381-94.000.
Charles of the Ritz Group Ltd.: *See*—
Puchalski, Eugene; Donahue, Frances A.; and Dixon, Richard P., 4,416,873., Cl. 424-177.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
Curtiss, William P.; and Fulton, Donald E., 4,417,194., Cl. 322-47.000.
Charlon, Pierre: *See*—
Durand, Pierre; Charlon, Pierre; and Jouffroy, Guy, 4,416,856., Cl. 422-131.000.
Chartered Industries of Singapore Private Limited: *See*—
Sullivan, Leroy J., 4,416,186., Cl. 89-198.000.
Chartwell House Group Limited, The: *See*—
Bennett, Peter H. E., 4,416,655., Cl. 494-40.000.
Chellis, James G.: *See*—
Abrams, Richard F.; and Chellis, James G., 4,416,855., Cl. 422-111.000.
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Wiberger, Lars I.; Ronnow, Peter H.; Tenghlad, Per F.; and Hellman, Bert G. H., 4,416,332., Cl. 166-246.000.
Chemplex Company: *See*—
Adur, Ashok M., 4,416,944., Cl. 428-349.000.
Chen, Tsu F.; and Gottschalk, Juan M., to Sperry Corporation. Apparatus for evaluating slider flying dynamics. 4,416,144., Cl. 73-12.000.
Cherokee Products Company: *See*—
Miller, William T., 4,416,195., Cl. 99-544.000.
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Chester, Kern E. Spinal misalignment detective and corrective apparatus. 4,416,271., Cl. 128-57.000.
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Miller, Stephen J., 4,417,086., Cl. 585-530.000.
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Chikamasa, Hiroshi: *See*—
Tanaka, Yasuhinori; and Chikamasa, Hiroshi, 4,416,214., Cl. 118-410.000.
Chimienti, Domenico; and Vercesi, Arturo, to Honeywell Information Systems Inc. Bypass for prioritizing interrupts among microprocessors. 4,417,302., Cl. 364-200.000.
Chmela, John F.; Fletcher, Carl R.; and Sarnoff, Norton, to Ensar Corporation. Tab-top can opener. 4,416,171., Cl. 81-3.46R.
Chopra, Kuldip S.: *See*—
Salensky, George A.; Chopra, Kuldip S.; and Pappas, Nicholas J., 4,417,007., Cl. 523-442.000.
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Cooper, Ronald C. E., 4,416,426., Cl. 242-56.900.
Postle, Stephen R.; Thomas, Patrick D. P.; and Whitear, Brian R. D., 4,417,072., Cl. 560-86.000.
Ciba-Geigy Corporation: *See*—
Green, George E.; Losert, Ewald; Paul, John G.; and Zweifel, Hans, 4,416,975., Cl. 430-327.000.
Lohmann, Dieter; Roth, Martin; and Baumann, Marcus, 4,417,057., Cl. 548-429.000.
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Rosenberger, Siegfried, 4,417,071., Cl. 560-67.000.
Schutz, Hans U.; and Buhler, Arthur, 4,416,815., Cl. 260-145.00A.
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,417,058., Cl. 548-451.000.
Ciccotelli, Stephen S.: *See*—
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Cincotta, Louis: *See*—
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Ciriacks, Patrick E.; and Gibson, Gary S., to Snap-on Tools Corporation. Apparatus for determining the advance of a timing light. 4,417,211., Cl. 324-392.000.
Citizen Watch Company Limited: *See*—
Saito, Motoyuki; and Fukutome, Satoru, 4,417,113., Cl. 200-302.000.
Citron, Paul; Hepp, Dennis G.; and Jirak, Thomas L., to Medtronic, Inc. Apparatus for monitoring and storing utilizing a data processor. 4,417,306., Cl. 364-415.000.
Clairol Incorporated: *See*—
Wolfram, Leszek J.; Cohen, David; and Tehrani, Norman N., 4,416,297., Cl. 132-7.000.
Clare, Kenneth D.; and Ambrose, Michael F. J., to Fairey Engineering Limited. Freight containers. 4,416,385., Cl. 220-1.500.
Clark, Allen V.; Myers, Dirck V.; and Hatch, Vaughn L., to Coca Cola Company, The. Process for treating caramel colors. 4,416,700., Cl. 127-34.000.
Clatworthy, Michael C.; Mack, William P. S.; and Major, Douglas J., to Dunlop Limited. Tire treads and tires. 4, 16,316., Cl. 152-209.00R.
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Benedite, Claude; Lafaye, Marcel; Lenfant, Jean-Pierre; and Reynier, Jacques, 4,417,124., Cl. 219-121.0LH.
Cline, Charles D.; and Mills, Thomas L., to Para-Chem Southern, Inc. Frothing aid composition. 4,417,016., Cl. 524-156.000.
Coad, L. Dale, to Imperial Clevite Inc. Viscous spring damper. 4,416,445., Cl. 267-35.000.
Coal Industry (Patents) Limited: *See*—
McCaffrey, David J. A.; and Jones, William D., deceased, 4,416,769., Cl. 209-166.000.
Coca Cola Company, The: *See*—
Clark, Allen V.; Myers, Dirck V.; and Hatch, Vaughn L., 4,416,700., Cl. 127-34.000.
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Borghese, Valerio; Erratico, Pietro; and Coccetti, Silvano, 4,417,292., Cl. 361-87.000.
Cochennec, Jean-Yves. System to interconnect subscriber lines to a telephone automatic time division switch. 4,417,333., Cl. 370-66.000.
Cognion, Jean-Marie; and Durual, Pierre, to P.C.U.K. Produits Chimiques Ugine Kuhlmann. Process for preparing 2-(4-aminophenyl)-5-amino-benzimidazole and substituted derivatives. 4,417,056., Cl. 548-334.000.
Cogswell, Frederic N.; Griffin, Brian P.; and Smith, Clive P., to Imperial Chemical Industries PLC. Anisotropic melt-forming polymer. 4,417,043., Cl. 528-176.000.
Cohen, David: *See*—
Wolfram, Leszek J.; Cohen, David; and Tehrani, Norman N., 4,416,297., Cl. 132-7.000.
Coin Controls Limited: *See*—
Bellis, Robert D.; and Wood, Dennis, 4,416,364., Cl. 194-100.00A.
Cole, Morton S. Antistaling baking composition. 4,416,903., Cl. 426-18.000.
Colgate-Palmolive Company: *See*—
Wixon, Harold E., 4,416,811., Cl. 252-8.750.
Collin, Per H., to Asea AB. Process for the manufacture of crude iron and energy-rich gases. 4,416,689., Cl. 75-11.000.
Colotte, Guy E. P.: *See*—
McNaught, James B.; and Colotte, Guy E. P., 4,416,486., Cl. 296-190.000.
Colucci, Eugene C., to Union Carbide Corporation. Hydraulic drive liquid transfer pump system. 4,416,590., Cl. 417-231.000.
Combustion Engineering, Inc.: *See*—
Palmer, David N.; and Ferrell, Gary W., 4,416,915., Cl. 427-126.300.
Cominco Ltd.: *See*—
Kerby, Robert C.; and Krauss, Clifford J., 4,416,746., Cl. 204-114.000.
Commette, Denis S.; and Sundberg, Carl W., Jr., to Gusmer Corporation. Valved coupling for conduits. 4,416,305., Cl. 137-614.000.
Commissariat a l'Energie Atomique: *See*—
Feutrel, Claude, 4,416,848., Cl. 376-260.000.
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Sarrazin, Jean-Michel, 4,416,391., Cl. 220-304.000.
Compagnie Generale de Geophysique: *See*—
Rocroi, Jean-Pierre; and Gole, Francois, 4,417,210., Cl. 324-336.000.
Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris": *See*—
Lamy, Jacques E.; Michel, Dominique; and Serrano, Francisco D. M., 4,416,473., Cl. 285-41.000.
Concord Laboratories, Inc.: *See*—
Wheeler, Robert P., Jr., 4,416,984., Cl. 435-31.000.
Concord Scientific Corporation: *See*—
Stevens, R. D. Samuel, 4,416,748., Cl. 204-157.10P.
Condar Co.: *See*—
Cornelison, Richard C., 4,416,157., Cl. 73-747.000.
Congdon, James S.: *See*—
Murkland, Judd R.; and Congdon, James S., 4,417,265., Cl. 357-51.000.
Conoco Inc.: *See*—
Burke, Francis P., 4,416,424., Cl. 241-101.00B.
Evens, David A., 4,416,323., Cl. 165-11.00R.

Constantine, Albert: *See—*
Constantine, Albert B.; and Walker, Alan D., 4,416,225., Cl. 123-25.00E.

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Container Corporation of America: *See—*
Desmond, John D.; and Mesquida-Feirman, B., 4,416,411., Cl. 229-40.000.
Helms, Charles R., 4,416,843., Cl. 264-152.000.
Nauheimer, James F., 4,416,371., Cl. 206-289.000.

Conti, Romano. Machine for forming booklets of intercalated sheets. 4,416,447., Cl. 270-54.000.

Continental Group, Inc., The: *See—*
Walter, John, 4,416,386., Cl. 220-67.000.

Conwed Corporation: *See—*
Fair, Timothy K., Sr., 4,416,718., Cl. 156-344.000.

Conzelmann, Gerhard: *See—*
Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, 4,416,041., Cl. 28-255.000.

Cooper, Albert A.; El-Rayes, Mohamed; and Yates, Alan K., to Guardline Disposables Limited. Surgical cushion for cooling an organ. 4,416,281., Cl. 128-400.000.

Cooper, Ronald C. E., to Ciba-Geigy AG. Web treatment apparatus. 4,416,426., Cl. 242-56.900.

COP, Inc.: *See—*
Hillberg, Robert L., 4,416,078., Cl. 42-69.00R.

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Corbin, Edgar A., Jr.: *See—*
Lundstedt, Erik; and Corbin, Edgar A., Jr., 4,416,905., Cl. 426-34.000.

Cordis Corporation: *See—*
Saulson, Stanley H.; and Tarjan, Peter P., 4,416,282., Cl. 128-419.0PG.
Slocum, Chester D., 4,416,283., Cl. 128-419.0PG.

Corea, Emanuel R.: *See—*
Corea, John E.; Corea, Emanuel R.; and Tashlick, Irving, 4,416,841., Cl. 264-102.000.

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Cormier, Milton J., to University of Georgia Research Foundation, Inc. Use of N-phenyl-1-naphthylamine in the uterus to prevent pregnancy. 4,416,900., Cl. 424-330.000.

Cormier, William E., Jr.: *See—*
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Corning Glass Works: *See—*
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Montierth, Max R., 4,416,675., Cl. 55-502.000.
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Corsmeier, Robert J.: *See—*
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Corvers, Antonius; van den Broek, Cornelis W.; and Suverkropp, Geertrudes H., to Stamicarbon B.V. Process for the preparation of substituted glyoxylic acid derivatives. 4,417,053., Cl. 546-315.000.

Cosden Technology, Inc.: *See—*
Schwarz, Richard A., 4,417,003., Cl. 521-56.000.
Watson, James M.; Forward, Cleve H.; and Butler, James R., 4,417,085., Cl. 585-440.000.

Coutin, Pierre F.: *See—*
Hasquenoph, Jean H.; and Coutin, Pierre F., 4,416,437., Cl. 244-137.00R.

CPG Products Corp.: *See—*
Munson, Leo J.; Griauzde, Felix; Okada, David T.; and Loomis, Bernard, 4,416,455., Cl. 273-272.000.

Craig, Laurence B.; and Farina, Alfred J., to Thermocatalytic Corp. Porous ceramic combustion reactor. 4,416,619., Cl. 431-328.000.

Cranston Machinery Co., Inc.: *See—*
Moody, Jack M., 4,416,480., Cl. 294-83.00R.

Creative Pathways, Incorporated: *See—*
Young, Russell D., 4,417,129., Cl. 219-130.320.

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Crivello, James V., to General Electric Company. Photoinitiators. 4,417,061., Cl. 549-3.000.

Cromie, Harry W., to Baxter Travenol Laboratories, Inc. Miniature rotary infusion pump with slide latch and detachable power source. 4,416,595., Cl. 417-476.000.

Cronin, Gerald F.; and Fuller, Howard J., to Worcester Controls Corporation. Electronic controller for valve actuators. 4,417,312., Cl. 364-510.000.

CTS Corporation: *See—*
Bloom, Terry R., 4,416,624., Cl. 432-134.000.

Cueto, Agustin; and Robinson, Daniel E., to GK Technologies, Incorporated. Cord sets with power-factor control. 4,417,196., Cl. 323-210.000.

Cummings, John R. Self centering pipe cutting device. 4,416,062., Cl. 30-101.000.

Cummings, Leslie L. Gas operated down hole pump. 4,416,593., Cl. 417-344.000.

Cummins Engine Company, Inc.: *See—*
McDonald, Ross W., 4,416,244., Cl. 123-577.000.

Cunningham, Douglas J., to Britax (Wingard) Limited. Passive safety belt systems. 4,416,468., Cl. 280-802.000.

Cunningham, Douglas J.; and Sanders, George G., to Britax (Wingard) Limited. Passive safety belt system. 4,416,469., Cl. 280-804.000.

Cunningham, Richard N.; and Loeffler, Romain E., deceased (by Loeffler, Carolyn R., personal representative), to Manville Service Corporation. Apparatus for rapid annealing of refractory fiber bodies. 4,416,071., Cl. 34-155.000.

Cuomo, Jerome J.; Leary, Pamela A.; and Yee, Dennis S., to International Business Machines Corporation. Copper texturing process. 4,416,725., Cl. 156-635.000.

Curole, Michael A.: *See—*
Mundhenk, David L.; and Curole, Michael A., 4,416,333., Cl. 166-250.000.

Curren, Arthur N.; Forman, Ralph; Sovey, James S.; and Wintucky, Edwin G., to United States of America, National Aeronautics and Space Administration. Ion sputter textured graphite electrode plates. 4,417,175., Cl. 315-5.380.

Curtiss, William P.; and Fulton, Donald E., to Charles Stark Draper Laboratory, Inc., The. Induction generator system with switched capacitor control. 4,417,194., Cl. 322-47.000.

Custom Concepts, Incorporated: *See—*
Kubiatowicz, James F., 4,416,083., Cl. 46-208.000.

Cutter Laboratories, Inc.: *See—*
Norman, Melvin H.; Manske, Reinhold R.; and Sheehan, Neil J., 4,416,661., Cl. 604-86.000.

Czerney, Peter; Hartmann, Horst; and Liebscher, Jurgen, to Jenoptik Jena GmbH. Amino-substituted 2-cumaryl-(3)-chromenylium salts. 4,417,060., Cl. 548-525.000.

Dafoe, Charles A. Method of transvaginal sterilization. 4,416,660., Cl. 604-55.000.

Dahms, Francis A., to Emhart Industries, Inc. Glassware mold forming apparatus. 4,416,681., Cl. 65-264.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Tachibana, Eiichi; and Hikosaka, Shinichi, 4,416,215., Cl. 118-642.000.

Daicel Chemical Industries, Ltd.: *See—*
Toba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, 4,417,025., Cl. 525-54.210.

Daimler-Benz Aktiengesellschaft: *See—*
Scheurenbrand, Dieter, 4,416,303., Cl. 137-576.000.

Daiwa Seiko Inc.: *See—*
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Daloisio, Pasquale C.: *See—*
Smith, Rush B.; and Daloisio, Pasquale C., 4,416,374., Cl. 206-507.000.

Damiano, Joseph C. Lamp control device. 4,417,177., Cl. 315-73.000.

D'Amico, John J.; and Schafer, Tann R., to Monsanto Company. 3,5-Bis (trifluoromethyl)phenoxy carboxylic acids and derivatives thereof. 4,416,687., Cl. 71-109.000.

Damms, Anthony B.: *See—*
Rushby, Robert J.; and Damms, Anthony B., 4,417,136., Cl. 235-379.000.

D'Angelo, Charles: *See—*
Sarin, Vinod K.; Buljan, Sergej-Tomislav; and D'Angelo, Charles, 4,416,670., Cl. 51-295.000.

Daniels, Fitz A. S. C. Belt type garment for carrying tennis balls and the like. 4,416,404., Cl. 224-224.000.

D'Antonio, Joseph V., to Bates, Richard L., a part interest. Paint preserver. 4,416,387., Cl. 220-93.000.

Dardoufas, Kimon C.: *See—*
Marshall, Robert M.; Archie, William A.; and Dardoufas, Kimon C., 4,416,787., Cl. 252-8.800.

Darnell, Robert D.: *See—*
Ingle, William M.; Darnell, Robert D.; and Thompson, Stephen W., 4,416,913., Cl. 427-45.100.

Dart Industries Inc.: *See—*
Hulyalkar, Ramchandra K.; Baum, Gerald A.; and Hotchandani, Kanayo, 4,417,015., Cl. 524-139.000.

Das, Subodh K., to Aluminum Company of America. High temperature, corrosion resistant coating and lead for electrical current. 4,417,097., Cl. 174-110.00A.

Datta, Pabitra; and Friel, Ronald N., to RCA Corporation. Conductive video discs. 4,416,807., Cl. 252-511.000.

Daughenbaugh, Randall J.; and Dixon, Dale D., to Air Products and Chemicals, Inc. Allylamines from allyl alcohol. 4,417,074., Cl. 564-479.000.

Daum, Gerhard: *See—*
Ackermann, Otto; and Daum, Gerhard, 4,417,073., Cl. 560-105.000.

Davida, George I., to Wisconsin Alumni Research Foundation. Cryptographic key sharing circuit and method using code correction. 4,417,338., Cl. 371-37.000.

Davidson, Gary W.: *See—*
Popard, Earl E.; Sedlar, Michael F.; and Davidson, Gary W., 4,417,183., Cl. 315-291.000.

Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. 1-[3-(6-Fluoro-1,2-benzisoxazol-3-yl)propyl]-4-hydroxyl-4-phenylpiperidines to treat pain. 4,416,887., Cl. 424-267.000.
Davis, Paul K.: *See*—
Miller, Robert F.; and Davis, Paul K., 4,416,474., Cl. 285-47.000.
Davis, Stephen H.; and Simpson, Daniel W., to Water Refining Company, Inc. Valve mechanism for multiple distributor fluid treatment system. 4,416,773., Cl. 210-289.000.
Davis, Walter Z., to Helical Control Systems, Inc. Process and apparatus for monitoring length and diameter of helical corrugated pipe. 4,416,131., Cl. 72-12.000.
Davis, William F., to Motorola, Inc. Operational amplifier. 4,417,216., Cl. 330-294.000.
Davison, Charles F., to Norwood Marking & Equipment Co., Inc. Multicolor imprinter. 4,416,199., Cl. 101-193.000.
Davy-Loewy Limited: *See*—
Marshall, Robert, 4,416,137., Cl. 72-243.000.
Dawson, Christopher R.; and Purkis, Ronald E., to United States of America, Navy. Small arms firing effects simulator. 4,416,631., Cl. 434-16.000.
Dawson, William, to Lilly Industries Limited. Method of treating hypersensitivity disease with benzoxazole derivatives. 4,416,892., Cl. 424-272.000.
Dayco Corporation: *See*—
White, Jack D., Jr., 4,416,647., Cl. 474-134.000.
Deardurff, Lawrence R., to Owens-Illinois, Inc. Apparatus for forming parisons. 4,416,608., Cl. 425-548.000.
Decca Limited: *See*—
Holyman, Brian T.; and Baty, Charlton R., 4,417,220., Cl. 333-174.000.
Decker, Tracey Donaldson: *See*—
Staten, Harold D., 4,416,045., Cl. 29-229.000.
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Knorre, Helmut; Fischer, Joachim; and Stutzel, Klaus, 4,416,786., Cl. 210-746.000.
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Bethge, Horst; Kleemann, Axel; and Martens, Jergen, 4,416,827., Cl. 260-501.120.
Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, 4,416,828., Cl. 260-501.120.
Dehmel, Rudiger; Maelzer, Martin; and Seyb, Christian, to Luther & Maelzer GmbH. Printed circuit board tester and adapter with memory. 4,417,204., Cl. 324-73.0PC.
Del Mar Avionics: *See*—
Woods, Donald C., 4,417,254., Cl. 346-33.00R.
Delamontagne, Robert P. Management teaching game method. 4,416,454., Cl. 273-243.000.
deLarosiere, Pierre J. Interlocking stackable bottles. 4,416,373., Cl. 206-432.000.
Del Grande, Donald J. Audible alarm network. 4,417,235., Cl. 340-531.000.
De Longchamp, Jacques H., to Dosapro Milton Roy. Diaphragm pump with compensation means in the hydraulic control chamber. 4,416,599., Cl. 417-386.000.
Demark, Anthony M.; and Erhardt, William K., to Honeywell Inc. High pressure electrical feedthru. 4,416,156., Cl. 73-727.000.
Demke, Kent R.; and Mumola, Joanne L., to International Business Machines Corp. Interactive combination display. 4,417,239., Cl. 340-709.000.
DeMoss, Dean: *See*—
Ragle, Herbert U.; and DeMoss, Dean, 4,417,289., Cl. 360-98.000.
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Bone, Arnold R., 4,416,407., Cl. 227-67.000.
Paradis, Joseph R., 4,416,838., Cl. 264-25.000.
Deregibus, Alfio, to I.T.S. S.r.l. Apparatus for producing reinforced tubing. 4,416,721., Cl. 156-428.000.
Dermall Limited: *See*—
Bernstein, Joel E., 4,416,886., Cl. 424-260.000.
Derner, Paul; and Mertin, Dietrich, to BFG GLASSGROUP. Insulating glass window structure. 4,416,101., Cl. 52-398.000.
Desmarais, Mark R.; and Yates, Mark A., to AMP Incorporated. Switch actuating assembly having improved cams and plural modes. 4,417,115., Cl. 200-340.000.
Desmond, John D.; and Mesquida-Feirman, B., to Container Corporation of America. Sleeve-type carton for tapered articles. 4,416,411., Cl. 229-40.000.
DeSoto, Inc.: *See*—
Murphy, Edward J.; Lewarchik, Ronald J.; and Thompson, Jeffrey W., 4,416,750., Cl. 204-159.190.
Desroches, Roger E.: *See*—
Lindner, James A.; and Desroches, Roger E., 4,416,279., Cl. 128-314.000.
Detweiler, Charles A., to Schmelzer Corporation. Valve assembly. 4,416,307., Cl. 137-625.660.
deVries, Egbert, to Quad Environmental Technologies Corp. Two stage odor control system. 4,416,861., Cl. 423-210.000.
Dey, Phillip; Fearns, Peter; Plessner, Karl W.; Pickup, Kenneth H.; Gaylard, Bernard; and Murphy, Arthur B., to BICC Public Limited Company. Overhead electric and optical transmission cables. 4,416,508., Cl. 350-96.230.
Diamond Shamrock Corporation: *See*—
Sinka, Joseph V.; and LieBerman, Robert A., 4,417,023., Cl. 524-731.000.
Dickson, LeRoy D., to International Business Machines Corporation. Method for making holographic optical elements with high diffraction efficiencies. 4,416,505., Cl. 350-3.710.
Diederich, Herbert; Gaffal, Karl; and Scherzer, Hugo, to Klein, Schanzlin & Becker Aktiengesellschaft. Submersible motor pump assembly. 4,416,586., Cl. 417-13.000.
Diefenbach, Horst: *See*—
Batzill, Wolfgang; and Diefenbach, Horst, 4,416,753., Cl. 204-181.00C.
Diesel Kiki Co., Ltd.: *See*—
Ishizuka, Yutaka, 4,416,190., Cl. 92-71.000.
Sutoh, Shinji; Hara Toshiro; Sugiura, Hiroyuki; and Kojima, Toshio, 4,416,324., Cl. 165-12.000.
Dietrich, Herbert, to Pfaff Industriemaschinen GmbH. Feed device equipment for letting out hides. 4,416,125., Cl. 69-21.000.
Dietsche, Wolfram: *See*—
Oeder, Dieter; Dietsche, Wolfram; Weiss, Stefan; Ziegler, Walter; Kueppers, Peter; and Hettche, Albert, 4,417,035., Cl. 526-208.000.
Digital Broadcasting Corporation: *See*—
Hills, Michael; Durret, Clay; and Von Meister, William, 4,417,349., Cl. 375-60.000.
Dill, Terry A., to Jefferson Industries Company. Egg collecting system and method. 4,416,219., Cl. 119-48.000.
DiLuccio, Robert C., to Du Pont de Nemours, E. I., and Company. Laminates of lamellar articles and polyolefins. 4,416,942., Cl. 428-332.000.
Dimovski, Milan: *See*—
Chamran, Morteza M.; and Dimovski, Milan, 4,417,180., Cl. 315-175.000.
Dimpfel, Fred; Hahn, Steven J.; Dyson, Brian J.; and Doyon, Sandra F. Adjustable leg assembly. 4,416,439., Cl. 248-188.600.
Dinwiddie, John M., Jr., to International Business Machines Corporation. Synchronous cycle steal mechanism for transferring data between a processor storage unit and a separate data handling unit. 4,417,304., Cl. 364-200.000.
DiPietro, Raymond B. Flue structure for domestic heating equipment. 4,416,254., Cl. 126-307.00A.
Dischert, Robert A., to RCA Corporation. Adaptive reconstruction of the color channels of a color TV signal. 4,417,269., Cl. 358-12.000.
Disselbeck, Dieter, to Hoechst Aktiengesellschaft. Method to upgrade sewage treatment plants overloaded in continuous operation. 4,416,780., Cl. 210-617.000.
Distributed Control Systems, Inc.: *See*—
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Dixon, Dale D.: *See*—
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Dixon, Richard P.: *See*—
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Dobler, Klaus: *See*—
Hachtel, Hansjorg; and Dobler, Klaus, 4,417,208., Cl. 324-164.000.
Dr. C. Otto & Comp. G.m.b.H.: *See*—
Gernhardt, Paul; Thubeauville, Heinz; and Struck, Carl-Heinz, 4,416,732., Cl. 202-139.000.
Dolin, Russell L.: *See*—
Yono, Munim; and Dolin, Russell L., 4,416,120., Cl. 62-231.000.
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Puchalski, Eugene; Donahue, Frances A.; and Dixon, Richard P., 4,416,873., Cl. 424-177.000.
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Staten, Harold D., 4,416,045., Cl. 29-229.000.
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Dore, Charles F. G.; and Chambers, Geoffrey R., to United States of America, Health and Human Services. Roller infusion apparatus. 4,416,662., Cl. 604-154.000.
Dorler, Jack A.; Mosley, Joseph M.; Seeger, Richard O.; and Weitzel, Stephen D., to International Business Machines Corporation. Diode-transistor active pull up driver. 4,417,159., Cl. 307-270.000.
Dosapro Milton Roy: *See*—
De Longchamp, Jacques H., 4,416,599., Cl. 417-386.000.
Dougan, Larry. Automatic hog feeding system. 4,416,220., Cl. 119-51.110.
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Dougherty, Frank E., Sr., 4,416,400., Cl. 222-420.000.
Dougherty, Frank E., Sr., to Dougherty Brothers Company. One piece dispenser. 4,416,400., Cl. 222-420.000.
Dow Chemical Company, The: *See*—
Killat, George R.; and Wilson, Larry R., 4,416,729., Cl. 162-164.300.
Metzger, Bruce A., 4,416,937., Cl. 428-286.000.
Poindexter, Graham S., 4,416,818., Cl. 260-239.30A.
Solc, Jitka; and Haigh, Daniel H., 4,416,945., Cl. 428-407.000.
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Doyle, Edward A., to E. A. Doyle Manufacturing Corporation. Automatic machine for finishing cookware body blanks. 4,416,133., Cl. 72-58.000.
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Dimpfel, Fred; Hahn, Steven J.; Dyson, Brian J.; and Doyon, Sandra F., 4,416,439., Cl. 248-188.600.
Draft Systems, Inc.: *See*—
Totten, Roger, 4,416,430., Cl. 242-107.300.

Drago, Russell S.; and El A'mma, Anton, to University of Illinois Foundation. Heterogeneous anionic transition metal catalysts. 4,417,077., Cl. 568-454.000.

Dragon, Robert L.: *See—*
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Drake, Charles A., to Phillips Petroleum Company. Hydroisomerization. 4,417,089., Cl. 585-670.000.

Drescher GmbH & Co. KG: *See—*
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Jones, Thaddeus M., 4,417,199., Cl. 323-319.000.
Lambke, Bernard J., Jr., 4,416,089., Cl. 49-502.000.
Wilson, Herbert C., 4,416,152., Cl. 73-155.000.

Dressler, Daryl D., to Minnesota Mining and Manufacturing Company. Circuitry controlled by coded manual switching for producing a control signal. 4,417,247., Cl. 340-825.310.

Drexhage, Karl H., to Eastman Kodak Company. Color imaging devices and color filter arrays using photo-bleachable dyes. 4,416,961., Cl. 430-7.000.

Duerig, Thomas: *See—*
Albrecht, Joachim; Duerig, Thomas; Mercier, Olivier; and Weber, Walter, 4,416,706., Cl. 148-11.50C.

Duffy, Terrance W.: *See—*
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Dunbar, Frank C.: *See—*
Pierson, Marvin B.; and Dunbar, Frank C., 4,416,920., Cl. 427-349.000.

Duncan Electric Company, Inc.: *See—*
Mayfield, Glenn A., 4,417,198., Cl. 323-315.000.

Duncombe, Edward; Gratton, Charles P.; and Adamson, John, to United Kingdom Atomic Energy Authority. Nuclear fuel for liquid metal cooled nuclear reactors. 4,416,851., Cl. 376-399.000.

Dunder, Thomas A.: *See—*
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Dunlop Limited: *See—*
Clatworthy, Michael C.; Mack, William P. S.; and Major, Douglas J., 4,416,316., Cl. 152-209.00R.

Dunn, David J., to Loctite (Ireland) Limited. Composition and process for the impregnation and sealing of porous articles. 4,416,921., Cl. 427-353.000.

Du Pont de Nemours, E. I., and Company: *See—*
Barsotti, Robert J., 4,416,941., Cl. 428-328.000.
Bascom, Laurence N.; and Leung, Peter S. K., 4,416,935., Cl. 428-229.000.
DiLuccio, Robert C., 4,416,942., Cl. 428-332.000.
Fusselman, David F.; and Lemke, Timothy A., 4,416,501., Cl. 339-97.00R.
Goff, David L., 4,416,973., Cl. 430-281.000.
Haskell, Vernon C., 4,416,938., Cl. 428-289.000.
Held, Robert P., 4,416,968., Cl. 430-199.000.
Jacobson, Howard W., 4,416,699., Cl. 106-300.000.
Mahr, Tibor G.; and Subramanian, Pallatheri M., 4,416,749., Cl. 204-159.140.
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Durand, Pierre; Charlon, Pierre; and Jouffroy, Guy, to Societe Chimique des Charbonnages—CdF Chimie. Process for the polymerization and copolymerization of ethylene, using a gas injector device. 4,416,856., Cl. 422-131.000.

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Durual, Pierre: *See—*
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Dynamit Nobel AG: *See—*
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Dynatrans AB: *See—*
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Dyneer Corporation: *See—*
Radocaj, Mijo, 4,416,648., Cl. 474-135.000.

Dyson, Brian J.: *See—*
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E M I-Varian Limited: *See—*
Tuck, Richard A.; and Skinner, Heather B., 4,417,173., Cl. 313-346.00R.

E/M Lubricants, Inc.: *See—*
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E. R. Squibb & Sons, Inc.: *See—*
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., 4,416,833., Cl. 260-941.000.
Nakane, Masami; Snitman, David L.; Reid, Joyce; and Haslanger, Martin F., 4,416,896., Cl. 424-285.000.
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E-Systems, Inc.: *See—*
Gershberg, David N.; Lee, Alexander Y., Jr.; and Moore, William B., 4,417,157., Cl. 307-256.000.

E.W. Buschman Company, The: *See—*
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East/West Industries, Inc.: *See—*
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Kissel, Thomas R., 4,416,735., Cl. 204-1.00T.
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Sandhu, M. Akram; Wright, John F.; and Molaire, Michel F., 4,416,965., Cl. 430-109.000.

Easton, Richard L.; and Friedlund, Richard H., to LubeCon Maintenance Systems, Inc. Trolley and chain cleaner. 4,416,367., Cl. 198-496.000.

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Maltby, Edgar W., 4,416,416., Cl. 236-86.000.

Ebbeson, Bengt E. O., to Origoverken I Halmstad Aktiebolag. Apparatus for burning spirit or similar liquid fuels. 4,416,617., Cl. 431-326.000.

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Ebey, Edward: *See—*
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Brandsness, Gordon T.; Ebright, Robert L.; and Orosz, Alexander J., 4,416,497., Cl. 339-17.00F.

Edgerton, Allen T. Utility yard marker. 4,416,414., Cl. 232-39.000.

Edlund, Carl E., to Southern Gas Association. Mechanical valve analog. 4,417,164., Cl. 307-497.000.

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Eglasstrek Patent Promotion & Awarding GmbH: *See—*
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Egorov, Leonid P.: *See—*
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Ei, David D., to Interface Systems, Inc. Interface for data communication systems using serial biphase data transmissions. 4,417,320., Cl. 364-900.000.

Eichelberger, Charles W.; and Wojnarowski, Robert J., to General Electric Company. Electrical conductors arranged in multiple layers and preparation thereof. 4,416,914., Cl. 427-54.100.

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Salensky, George A.; Chopra, Kuldip S.; and Pappas, Nicholas J., 4,417,007., Cl. 523-442.000.
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Ellis, Frank. Apparatus for feeding fuel to a marine engine. 4,416,638., Cl. 440-88.000.
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Aykan, Kamran; Farrauto, Robert J.; Jefferson, Clinton F.; and Lanam, Richard D., 4,416,916., Cl. 427-160.000.
Enomoto, Shogo; Sawai, Masanobu; Seo, Iwao; and Yamaguchi, Tomonobu, to Teikoku Hormone Mfg. Co. Ltd.; and Mitsubishi Petrochemical Co., Ltd. Apparatus for vibrating the ulna in vivo. 4,416,269., Cl. 128-41.000.
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Erickson, Wayne K.; and Mulligan, Lewis R., to Phillips Petroleum Company. Nonwoven fabric and method for its production. 4,416,936., Cl. 428-286.000.
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Evens, David A., to Conoco Inc. Air cooler freeze protection. 4,416,323., Cl. 165-11.00R.
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Exxon Production Research Co.: *See—*
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Fiala, Ernst, to Volkswagenwerk Aktiengesellschaft. Drive for automobile automatic transmission. 4,416,360., Cl. 192-0.076.
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Simpson, Barbara E.; and Gervais, Norman A., 4,416,659., Cl. 604-48.000.
Gesellschaft fur Biotechnologische Forschung mbH (GBF): *See—*
Morr, Michael; and Kula, Maria-Regina, 4,416,830., Cl. 260-929.000.
Gesellschaft fur Schwerionenforschung mbH: *See—*
Fischer, Bernd, 4,416,724., Cl. 156-628.000.
Geurtsen, Alfonsus A., to Machinefabriek Geurtsen Deventer B.V. Reel for a life-line. 4,416,351., Cl. 182-238.000.
Ghandhi, Burzoe K., to Outboard Marine Corporation. Device for reducing evaporation loss from carburetors and fuel tanks. 4,416,108., Cl. 56-17.500.
Ghatak, Paritosh K. Door frame reinforcer. 4,416,087., Cl. 49-462.000.
Ghosh, Shyamal-Krishna, to Siemens Aktiengesellschaft. Sectional motor starting winding circuit for three-phase motors. 4,417,192., Cl. 318-797.000.
Gibbons, Everett E.: *See—*
Klus, John P.; Gibbons, Everett E.; Brodsky, Eric L.; and Janule, Victor P., 4,416,148., Cl. 73-64.400.

Gibson, Donald B.; and Laughinghouse, Gerald F., to Champion International Corporation. Method of producing a steel caul. 4,416,170., Cl. 76-107.00R.
Gibson, Gary S.: *See*—
Ciriacks, Patrick E.; and Gibson, Gary S., 4,417,211., Cl. 324-392.000.
Gikis, Benjamin J.; Jones, Abner Y.; and Elbrecht, Rudolf, to Natomas Energy Company. Method and appratus for extracting tar sand. 4,416,764., Cl. 208-11.0LE.
Giler, Roger R., to Kanthal Corporation, The. High temperature melting furnace. 4,417,346., Cl. 373-137.000.
Gillette Company, The: *See*—
Bache, Roger J., 4,416,912., Cl. 427-13.000.
Gillmer, Thomas C. Manageable safety dinghy. 4,416,639., Cl. 440-106.000.
Gingerich, David J.; McCarty, Patrick R.; and Shaffer, David T., to AMP Incorporated. Sealed electrical contact assembly and electrical switch made therefrom. 4,417,106., Cl. 200-5.00R.
Giprokox: *See*—
Likhogub, Evgeny P.; Sergeev, Stanislav S.; and Minasov, Alexandr N., 4,416,733., Cl. 202-228.000.
Girmes-Werke AG: *See*—
Kerres, Bruno, 4,416,782., Cl. 210-634.000.
GK Technologies, Incorporated: *See*—
Cueto, Agustin; and Robinson, Daniel E., 4,417,196., Cl. 323-210.000.
Glaser, Nicholas W., Jr., to W. H. Brady Co. Membrane switch assembly with modular switch portions. 4,417,105., Cl. 200-5.00A.
Glass, Benjamin G. Multi-stage turbine rotor. 4,416,582., Cl. 415-59.000.
Gloth, Richard E.; and Tazuma, James J., to Goodyear Tire & Rubber Company, The. Polymeric antioxidants prepared from diphenylamine and dialkylalkenylbenzene or dihydroxyalkylbenzene. 4,417,017., Cl. 524-255.000.
Godau, Eckard. Sheet-dyeing apparatus. 4,416,124., Cl. 68-9.000.
Goddard, John; and Mills, David, to Rolls Royce Limited. Method of manufacture of articles with internal passages therein and articles made by the method. 4,416,321., Cl. 164-80.000.
Goebel, Franz; and McDonald, Robert C., to GTE Products Corporation. Electrochemical cell. 4,416,957., Cl. 429-91.000.
Goff, David L., to Du Pont de Nemours, E. I., and Company. Radiation-sensitive polyimide precursor composition derived from a diaryl fluoro compound. 4,416,973., Cl. 430-281.000.
Goidinger, Johann. Slab-shaped building element. 4,416,098., Cl. 52-309.160.
Golden Valley Foods Inc.: *See*—
Watkins, James D., 4,416,906., Cl. 426-107.000.
Watkins, James D., 4,416,907., Cl. 426-234.000.
Gole, Francois: *See*—
Rocroi, Jean-Pierre; and Gole, Francois, 4,417,210., Cl. 324-336.000.
Goll, Werner, to SKW Trostberg Aktiengesellschaft. Varnish and a method of coating plastic with polyvinylidene fluoride. 4,416,925., Cl. 427-393.500.
Gomez-Olea Naveda, Mariano. Magneto-electronic locks. 4,416,127., Cl. 70-276.000.
Goodman, Mark; Zeno, John R.; and Borruso, Marty, to UE Systems, Inc. Ultrasonic leak detecting method and apparatus. 4,416,145., Cl. 73-40.50A.
Goodstine, Stephen L.; and Jones, Brian C. Fluidized bed residential heating system. 4,416,418., Cl. 237-19.000.
Goodyear Tire & Rubber Company, The: *See*—
Gloth, Richard E.; and Tazuma, James J., 4,417,017., Cl. 524-255.000.
Goto, Tukasa: *See*—
Nishida, Minoru; Hattori, Tadashi; Mukainakano, Shinichi; Mizuno, Toru; and Goto, Tukasa, 4,416,226., Cl. 123-143.00B.
Gottschalk, Juan M.: *See*—
Chen, Tsu F.; and Gottschalk, Juan M., 4,416,144., Cl. 73-12.000.
Grabbe, Dimitry G., to AMP Incorporated. Power and ground plane structure for chip carrier. 4,417,266., Cl. 357-80.000.
Graber, Joseph V. Bicycle storage device. 4,416,379., Cl. 211-19.000.
Graham Magnetics, Incorporated: *See*—
Jackman, James E., 4,416,702., Cl. 134-6.000.
Graiff, L. B.; Murphy, Z. L.; and Scott, J. A. N., to Shell Oil Company. Fuel and lubricant compositions for octane requirement reduction. 4,416,669., Cl. 44-71.000.
Gratton, Charles P.: *See*—
Duncombe, Edward; Gratton, Charles P.; and Adamson, John, 4,416,851., Cl. 376-399.000.
Gravel, Robert: *See*—
Gauthier, Yves; and Gravel, Robert, 4,416,105., Cl. 54-71.000.
Gravely, Benjamin T. Heat storage means. 4,416,258., Cl. 126-428.000.
Gray, Kenneth W.; Pattison, James E.; and Rees, Huw D., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Transferred electron devices. 4,417,261., Cl. 357-3.000.
Gray, Lewis: *See*—
McGinnis, Ralph E.; and Gray, Lewis, 4,416,457., Cl. 277-53.000.
Graziano, Frank D.; and Kuziemka, Edmund J., to Material Sciences Corporation. Organopolysiloxane coating compositions. 4,417,006., Cl. 523-435.000.
Great Lakes Carbon Corporation: *See*—
Hogg, Grady R., Jr.; and Tanner, Nathan S., 4,417,344., Cl. 373-93.000.
Greefe, Klaus: *See*—
Schmitt, Herrmann; Sellner, Rudolf; and Greefe, Klaus, 4,417,222., Cl. 335-6.000.
Green, George E.; Losert, Ewald; Paul, John G.; and Zweifel, Hans, to Ciba-Geigy Corporation. Photopolymerization process employing compounds containing acryloyl groups and maleimide groups. 4,416,975., Cl. 430-327.000.
Green, Laddie L., to Stauffer Chemical Company. Trifluoroethyl-p-chlorophenylcarbamate herbicide antidote. 4,416,685., Cl. 71-95.000.
Greene, Jeffrey L.: *See*—
Halbich, Frank; and Greene, Jeffrey L., 4,416,775., Cl. 210-236.000.
Greenwalt, Richard B., to Raymond Kaiser Engineers, Inc. Direct reduction of ores and concentration of metallic values. 4,416,688., Cl. 75-6.000.
Greig, Colin C.; and Hook, Richard G., to Union Camp Corporation. Smoking-material rods and a method of making such rods. 4,416,295., Cl. 131-364.000.
Griauzde, Felix: *See*—
Munson, Leo J.; Griauzde, Felix; Okada, David T.; and Loomis, Bernard, 4,416,455., Cl. 273-272.000.
Griff Williams Co.: *See*—
Lecznar, Chester J.; and Williams, Griff E., 4,416,600., Cl. 425-7.000.
Griffin, Brian P.: *See*—
Bailey, Derrick S.; and Griffin, Brian P., 4,417,020., Cl. 524-502.000.
Cogswell, Frederic N.; Griffin, Brian P.; and Smith, Clive P., 4,417,043., Cl. 528-176.000.
Grimes, Jerry L. Connector valve assembly for endotracheal tubes. 4,416,273., Cl. 128-207.160.
Grimshaw, Scott F.: *See*—
Ceasar, Gerald P.; and Grimshaw, Scott F., 4,416,755., Cl. 204-192.00S.
Gritschke, Martin: *See*—
Lohrberg, Karl; Pfohl, Rainer; and Gritschke, Martin, 4,416,744., Cl. 204-95.000.
Groh, Gunther; Weiss, Hermann; Wagner, Wolfgang; Pasedach, Klaus; Kowalski, Gunter; and Meyer-Ebrecht, Dietrich, to U.S. Philips Corporation. Fan beam CT scanner with compensating detector motion. 4,417,353., Cl. 378-4.000.
Gross, Siegfried: *See*—
Hesse, Heinrich; Merkler, Anton; Gross, Siegfried; and Radtke, Gerhard, 4,416,139., Cl. 72-267.000.
Grossman, M. Gary: *See*—
Breslau, Steven M.; and Grossman, M. Gary, 4,416,528., Cl. 354-296.000.
Grossmann, Hans, to Sandoz Ltd. 1:2 Chromium complex of 1-amino-2-(3',5'-dinitro-2'-hydroxyphenylazo)-4-sulfonaphthalene and alkali metal salts thereof. 4,416,816., Cl. 260-151.000.
Grote & Hartmann GmbH & Co. KG: *See*—
Muller, Wulf; and Kaiser, Manfred, 4,417,225., Cl. 337-198.000.
Grousseau, Alain, to Thomson-CSF. Monitoring device for a radio navigation system of the doppler VOR type. 4,417,250., Cl. 343-405.000.
Grove Valve and Regulator Company: *See*—
Brumm, Richard S., 4,416,301., Cl. 137-220.000.
Grow, Robert M., to Burroughs Corporation. Write token regeneration in a timed token ring. 4,417,243., Cl. 340-825.050.
Gruller, David L.: *See*—
Fowler, John H.; and Gruller, David L., 4,416,472., Cl. 285-3.000.
GTE Automatic Electric Labs Inc.: *See*—
Kelly, Michael J.; Lindsay, Robert L.; Kobylar, Alex W.; and Stelte, David J., 4,417,335., Cl. 370-110.100.
Sabon, Robert J.; and Vonder, David L., 4,417,205., Cl. 324-133.000.
GTE Laboratories Incorporated: *See*—
McCarthy, Jeremiah P.; and Tabasky, Marvin, 4,416,055., Cl. 29-577.00C.
Sarin, Vinod K.; Buljan, Sergej-Tomislav; and D'Angelo, Charles, 4,416,670., Cl. 51-295.000.
GTE Products Corporation: *See*—
Goebel, Franz; and McDonald, Robert C., 4,416,957., Cl. 429-91.000.
Guardline Disposables Limited: *See*—
Cooper, Albert A.; El-Rayes, Mohamed; and Yates, Alan K., 4,416,281., Cl. 128-400.000.
Guenther, Kenneth L.: *See*—
Zemke, Edward H.; Guenther, Kenneth L.; and Baethke, Friedrich W., 4,416,563., Cl. 403-14.000.
Guerrero, Benjamin G.; and Berford, Saint Elmo B., to Mattel, Inc. Ring viewer. 4,416,074., Cl. 40-364.000.
Gugel, Georg: *See*—
Kastl, Hans; and Gugel, Georg, 4,416,846., Cl. 376-249.000.
Gugliermotte, Francis: *See*—
Geller, Richard; and Gugliermotte, Francis, 4,417,178., Cl. 315-111.810.
Guhne, Wieland: *See*—
Ahlf, Heinz-Jurgen; and Guhne, Wieland, 4,416,034., Cl. 15-354.000.
Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, to Rieter Deutschland GmbH. Apparatus for threading a thread into a texturizing nozzle. 4,416,041., Cl. 28-255.000.
Gulack, Max A. Educational and recreational mathematical device in the form of a band, ring or concentric rings. 4,416,633., Cl. 434-188.000.

Guldenfels, Dieter: *See*—
Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, 4,416,041., Cl. 28-255.000.

Gulf & Western Manufacturing Company: *See*—
Horwinski, E. Robert, 4,416,591., Cl. 417-241.000.

Gunderson, Robert O.; Kocol, James E.; and Schuck, David B., to NCR Corporation. Data processing system having dual-channel system bus. 4,417,334., Cl. 370-85.000.

Gundlach, Robert W., to Xerox Corporation. Cleaning system. 4,416,537., Cl. 355-15.000.

Gusmer Corporation: *See*—
Commette, Denis S.; and Sundberg, Carl W., Jr., 4,416,305., Cl. 137-614.000.

Gut, Edwin: *See*—
Haggenmacher, Thomas; Gut, Edwin; Friedli, Hans; and Maugweiler, Gottfried, 4,416,489., Cl. 299-94.000.

Gutierrez, Antonio: *See*—
Brois, Stanley J.; and Gutierrez, Antonio, 4,417,062., Cl. 549-320.000.

Gutzmer, Christian: *See*—
Asdollahi, Norbert; and Gutzmer, Christian, 4,417,226., Cl. 337-273.000.

Gyurics, Karoly: *See*—
Szendrodi, Valer; and Gyurics, Karoly, 4,416,435., Cl. 244-114.00R.

H. G. Enterprises: *See*—
Nelkin, Nedwyn R., 4,416,272., Cl. 128-96.000.

H. & K. Bradley (Trailer Equipment) Limited: *See*—
Bradley, Harry S., 4,416,467., Cl. 280-512.000.

Haas, Werner J.; and Scribano, Frank C., to Siemens Gammasonics, Inc. Apparatus for driving a radiation detector. 4,417,143., Cl. 250-363.00S.

Habegger, Friedhelm: *See*—
Bruning, Rolf; and Habegger, Friedhelm, 4,416,680., Cl. 65-144.000.

Hachiro, Nobuaki: *See*—
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,416,191., Cl. 92-165.0PR.

Hachtel, Hansjorg; and Dobler, Klaus, to Robert Bosch GmbH. Apparatus for contactless distance and/or speed measurement. 4,417,208., Cl. 324-164.000.

Haemonetics Corporation: *See*—
Schoendorfer, Donald W.; and Hansen, Lee E., 4,416,654., Cl. 494-10.000.

Hafner, Udo: *See*—
Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, 4,416,238., Cl. 123-470.000.
Krauss, Rudolf; and Hafner, Udo, 4,416,423., Cl. 239-585.000.

Haga, Shoji: *See*—
Arai, Hajime; and Haga, Shoji, 4,416,168., Cl. 74-740.000.

Haga, Yukio; Kai, Tomeo; Shirayama, Akira; and Kanatani, Gengi, to Nippon Kokan Kabushiki Kaisha. Claw crane with pushers. 4,416,580., Cl. 414-626.000.

Hagen, James M.; and King, James D., to United States of America, Navy. Weapons effect signature simulator. 4,416,630., Cl. 434-16.000.

Hager, Donald G.; Massey, Michael L.; and Rubel, Frederick, Jr., to Westvaco Corporation. Pulsed regeneration of adsorption column. 4,416,798., Cl. 502-420.000.

Haggenmacher, Thomas; Gut, Edwin; Friedli, Hans; and Maugweiler, Gottfried, to Swiss Aluminium Ltd. Chisel for a crust breaking facility. 4,416,489., Cl. 299-94.000.

Hagino, Tadao, to Olympus Optical Co., Ltd. Endoscope having two detachable armour tubes. 4,416,268., Cl. 128-6.000.

Hahn, Steven J.: *See*—
Dimpfel, Fred; Hahn, Steven J.; Dyson, Brian J.; and Doyon, Sandra F., 4,416,439., Cl. 248-188.600.

Haigh, Daniel H.: *See*—
Solc, Jitka; and Haigh, Daniel H., 4,416,945., Cl. 428-407.000.

Haisma, Jan: *See*—
Hugues, Edgard A.; Bacchus, Jean-Marie; and Haisma, Jan, 4,416,518., Cl. 350-427.000.

Hakusan Seissaku-sho Co., Ltd.: *See*—
Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; and Amano, Takayoshi, 4,416,158., Cl. 73-842.000.

Halbach & Braun: *See*—
Braun, Ernst; and Braun, Gert, 4,416,643., Cl. 464-38.000.

Halbich, Frank; and Greene, Jeffrey L., to STD Filter Company, Inc. In-line filter and cartridge therefor. 4,416,775., Cl. 210-236.000.

Halkey-Roberts Corporation: *See*—
Zimmerly, Harry L., 4,416,393., Cl. 222-5.000.

Hall, Robert M., to Steri-Pac, Inc. Self-sterilizing hypodermic syringe. 4,416,663., Cl. 604-163.000.

Hama, Yoshihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Image magnification control mechanism for facsimile zoom lens. 4,417,281., Cl. 358-287.000.

Hamai, Kazuo: *See*—
Hiromi, Fukuoka; Matsuo, Masataka; Hamai, Kazuo; Hatta, Tokuaki; and Sugawara, Mituo, 4,416,999., Cl. 501-94.000.

Hammann, Ingeborg: *See*—
Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,416,832., Cl. 260-940.000.

Hamon-Sobelco, S.A.: *See*—
Bosne, Jacques G. P. E., 4,416,835., Cl. 261-110.000.

Hansen, Lee E.: *See*—
Schoendorfer, Donald W.; and Hansen, Lee E., 4,416,654., Cl. 494-10.000.

Haq, Zia, to Lever Brothers Company. Packaging film and packaging of detergent compositions therewith. 4,416,791., Cl. 252-90.000.

Hara, Shuji: *See*—
Muramatsu, Tsuyoshi; and Hara, Shuji, 4,416,368., Cl. 198-604.000.

Hara Toshizo: *See*—
Sutoh, Shinji; Hara Toshizo; Sugiura, Hiroyuki; and Kojima, Toshio, 4,416,324., Cl. 165-12.000.

Harada, Yoshimichi: *See*—
Sato, Takashi; Mukai, Makoto; Nagata, Shiro; Harada, Yoshimichi; and Kirita, Yasuzo, 4,416,772., Cl. 210-137.000.

Harari, Eliyahou. Highly scaleable dynamic ram cell with self-signal amplification. 4,417,325., Cl. 365-185.000.

Harbison, William H.: *See*—
Mohnach, Michael G.; and Harbison, William H., 4,416,032., Cl. 15-250.320.

Hardy, Doralyn Ann: *See*—
Schramm, Arthur G.; and Shaffer, Jack C., 4,416,715., Cl. 156-210.000.

Harra, David J.; Turner, Frederick T.; and Hutchinson, Martin A., to Varian Associates, Inc. Sputter system incorporating an improved blocking shield for contouring the thickness of sputter coated layers. 4,416,759., Cl. 204-298.000.

Harris Corporation: *See*—
Hunsinger, Bill J., 4,417,221., Cl. 333-194.000.

Harshbarger, John H.; and Shores, William M., to Visual Information Institute, Inc. Selectable rate sync generator system. 4,417,275., Cl. 358-139.000.

Hartley, Croydon R.: *See*—
Bettner, Timothy J.; Sullivan, Frank E.; and Hartley, Croydon R., 4,416,175., Cl. 83-29.000.

Hartman, George D., to Merck & Co., Inc. Di(alkylamino) derivatives of chloronitropyrazines useful as adjuncts to radiation therapy. 4,416,882., Cl. 424-250.000.

Hartmann, Horst: *See*—
Czerney, Peter; Hartmann, Horst; and Liebscher, Jurgen, 4,417,060., Cl. 548-525.000.

Hartry, Donald R.; and Belli, Remo D., to Remo, Inc. Pretuned head for drum or the like. 4,416,181., Cl. 84-272.000.

Harty, William E.: *See*—
Shidlovsky, Igal; and Harty, William E., 4,416,789., Cl. 252-34.700.

Harvey, Philip C. Aircraft navigation computer. 4,417,309., Cl. 364-450.000.

Haseda, Satoshi: *See*—
Shiozaki, Makoto; Haseda, Satoshi; Tarui, Jun; Ito, Osamu; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Kawai, Shizuo; and Sami, Hiroshi, 4,416,232., Cl. 123-357.000.

Hasegawa, Akira: *See*—
Tomioka, Shunzo; Okano, Kinpei; Matsuo, Masanori; Hasegawa, Akira; and Kitamura, Akira, 4,416,555., Cl. 384-415.000.
Yamato, Noboru; Hasegawa, Akira; and Shimizu, Ippei, 4,416,471., Cl. 282-27.500.

Hasegawa, Masakazu; Takaoka, Michio; Oshima, Hiroto; and Kataoka, Keiichiro, to Fujikura Cable Works, Ltd. Continuous vulcanizer. 4,416,601., Cl. 425-68.000.

Hasha, Brian B. Apparatus and method for hydrostatically testing pipe. 4,416,147., Cl. 73-49.600.

Hashida, Wataru: *See*—
Matsuo, Takaharu; Sawamura, Norio; Hashimoto, Yukio; and Hashida, Wataru, 4,416,991., Cl. 435-134.000.

Hashimoto, Akihiko: *See*—
Shimizu, Hideharu; and Hashimoto, Akihiko, 4,416,616., Cl. 431-325.000.

Hashimoto, Iwao: *See*—
Fujii, Setsuro; Yasui, Bompei; Nakamura, Mitsuo; Miyamoto, Tomohisa; Ando, Kazuko; Hashimoto, Iwao; Sawai, Yoneichi; Umeda, Naoki; and Kawasaki, Masahiro, 4,416,875., Cl. 424-180.000.

Hashimoto, Takafumi; and Kobari, Yukio, to Meidensha Electric Mfg. Co., Ltd. Secondary battery. 4,416,953., Cl. 429-18.000.

Hashimoto, Yasuichi: *See*—
Hattori, Toshiaki; and Hashimoto, Yasuichi, 4,417,288., Cl. 360-74.100.

Hashimoto, Yukio: *See*—
Matsuo, Takaharu; Sawamura, Norio; Hashimoto, Yukio; and Hashida, Wataru, 4,416,991., Cl. 435-134.000.

Hashizume, Kenichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Heat exchangers. 4,416,223., Cl. 122-367.00C.

Haskell, Vernon C., to Du Pont de Nemours, E. I., and Company. Inorganic films with poly(vinyl alcohol). 4,416,938., Cl. 428-289.000.

Haslanger, Martin F.: *See*—
Nakane, Masami; Snitman, David L.; Reid, Joyce; and Haslanger, Martin F., 4,416,896., Cl. 424-285.000.

Hasquenoph, Jean H.; and Coutin, Pierre F., to R. Alkan & Cie. Safety lock for a carrying and jettisoning device for loads transported under aircraft. 4,416,437., Cl. 244-137.00R.

Hatch, Vaughn L.: *See*—
Clark, Allen V.; Myers, Dirck V.; and Hatch, Vaughn L., 4,416,700., Cl. 127-34.000.

Hatta, Tokuaki: *See*—
Hiromi, Fukuoka; Matsuo, Masataka; Hamai, Kazuo; Hatta, Tokuaki; and Sugawara, Mituo, 4,416,999., Cl. 501-94.000.

Hattori, Tadashi: *See*—
Nishida, Minoru; Hattori, Tadashi; Mukainakano, Shinichi; Mizuno, Toru; and Goto, Tukasa, 4,416,226., Cl. 123-143.00B.
Hattori, Toshiaki; and Hashimoto, Yasuichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Broke for magnetic disc drive apparatus. 4,417,288., Cl. 360-74.100.
Haudin, Jean-Marc: *See*—
Kepes, Andre; Weynant, Eric; Avenas, Pierre; and Haudin, Jean-Marc, 4,417,041., Cl. 526-348.600.
Havstad, Harold R., to Hudson Oxygen Therapy Sales Company. Percussor. 4,416,270., Cl. 128-53.000.
Hawk, James L. Method and apparatus for removal of aquatic plant growth. 4,416,106., Cl. 56-8.000.
Hayashi, Chihiro, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha. Process for manufacturing seamless metal tubes. 4,416,134., Cl. 72-68.000.
Hayashi, Isao: *See*—
Hayashi, Toshio; and Hayashi, Isao, 4,416,461., Cl. 280-5.00A.
Hayashi, Motokazu: *See*—
Kamei, Taketo; Hayashi, Motokazu; Osada, Kimio; and Kimura, Mitsutoshi, 4,417,176., Cl. 315-59.000.
Hayashi, Torahiko; Kageyama, Minoru; and Morikawa, Michio. Method of continuously manufacturing multi-layered dough materials. 4,416,910., Cl. 426-502.000.
Hayashi, Toshio; and Hayashi, Isao, to Nissan Motor Company, Limited. Fuel storage vessel supporting structure. 4,416,461., Cl. 280-5.00A.
Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Muffler. 4,416,350., Cl. 181-272.000.
Hayes, Derek. Gripping or locating devices. 4,416,503., Cl. 339-220.00R.
Hazel, Robert L.; and LaBudde, Edward V., to Burroughs Corporation. Optical memory system providing improved focusing control. 4,417,330., Cl. 369-32.000.
Hebert, Richard D.; and Lasky, Daniel J., to Ricoh Company, Ltd. Polarizing filters for enhancing contrast in xerographic copying machines. 4,416,530., Cl. 355-3.00R.
Heidelberger Druckmaschinen AG: *See*—
Rasenberger, Otto, 4,416,198., Cl. 101-3.00R.
Heiman, Frederic P., to Mars, Inc. Coin examination apparatus employing an RL relaxation oscillator. 4,416,365., Cl. 194-100.00A.
Heimbigner, Donald L. Bowling ball finger grip insert. 4,416,452., Cl. 273-63.00A.
Heinerman, Jacobus J. L.; and Post, Martin F. M., to Shell Oil Company. Process for the isomerization of paraffins. 4,417,090., Cl. 585-739.000.
Heinie, Richard L.: *See*—
Matalis, John A.; Heinie, Richard L.; and Wegerer, Duane E., 4,416.573., Cl. 411-378.000.
Heinrich Mack Nachf. Chem.-Pharmazeutische Fabrik: *See*—
Stoss, Peter, 4,417,065., Cl. 549-464.000.
Heitkamp, Dieter; and Inden, Peter, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method and apparatus for recovering raw material, especially uranium, from natural waters, especially from the sea. 4,416,860., Cl. 423-6.000.
Held, Robert P., to Du Pont de Nemours, E. I., and Company. Preparation of a printing master by toning a photopolymer film with magnetic toner. 4,416,968., Cl. 430-199.000.
Helfi, Alfred F.; and Muller, Jean-Claude H., to Societe Lorraine de Laminage Continu. Process and apparatus for detection of the stoppage of a tuyere for blowing a gas through the bottom of a refining converter. 4,416,443., Cl. 266-47.000.
Helical Control Systems, Inc.: *See*—
Davis, Walter Z., 4,416,131., Cl. 72-12.000.
Hellman, Bert G. H.: *See*—
Wiberger, Lars I.; Ronnow, Peter H.; Tengblad, Per F.; and Hellman, Bert G. H., 4,416,332., Cl. 166-246.000.
Helms, Charles R., to Container Corporation of America. Method of forming composite display package. 4,416,843., Cl. 264-152.000.
Henlan, Inc.: *See*—
Tanner, Curtis J.; Bender, Richard E.; Simson, Anton K.; and McCutchen, Hugh, Jr., 4,416,329., Cl. 166-68.000.
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, to U.S. Philips Corporation. Voltage-dependent resistor and method of producing such a resistor. 4,417,227., Cl. 338-21.000.
Henriques, Lance L. Mine ore concentrator. 4,416,771., Cl. 209-224.000.
Henry, James W., to Eastman Kodak Company. Electronic measuring method and apparatus. 4,417,274., Cl. 358-107.000.
Henry, John J., Sr.; and Stuckey, Buddy S., to Essex Group Incorporated. Apparatus for winding coils and inserting coils and wedges into stator cores. 4,416,058., Cl. 29-734.000.
Hensleigh, Robert H.; Lacy, Charles M.; and Walton, Hardy H., Jr. Television receiver scrambling system. 4,417,278., Cl. 358-188.000.
Hepp, Dennis G.: *See*—
Citron, Paul; Hepp, Dennis G.; and Jirak, Thomas L., 4,417,306., Cl. 364-415.000.
Heraeus Quarzschmelze GmbH: *See*—
Bruning, Rolf; and Habegger, Friedhelm, 4,416,680., Cl. 65-144.000.
Herbert, Linton M. X-Ray attenuating apron. 4,417,146., Cl. 250-516.100.
Hercules Incorporated: *See*—
Johnson, Gary W., 4,416,112., Cl. 60-251.000.
Scheve, Bernard J., 4,416,974., Cl. 430-288.000.
Herion, Dieter: *See*—
Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, 4,416,041., Cl. 28-255.000.
Hermann Berstorff Maschinenbau GmbH: *See*—
Brinkmann, Heinz, 4,416,543., Cl. 366-80.000.
Herrick, Carlyle S.; and Alben, Richard S., to General Electric Company. Solar heat collector. 4,416,264., Cl. 126-442.000.
Herrmann, Richard, Jr., to Boeing Company, The. Chromium plating. 4,416,738., Cl. 204-32.00R.
Herrmann, Ronald S. Sandpaper roll dispenser. 4,416,410., Cl. 229-38.000.
Herron, John R., Jr., to Illinois Tool Works Inc. Capacitive keyswitch. 4,417,294., Cl. 361-288.000.
Hesse, Heinrich; Merkler, Anton; Gross, Siegfried; and Radtke, Gerhard, to Mannesmann Aktiengesellschaft. Guiding a mandrel or punch for piercing or cold-extrusion. 4,416,139., Cl. 72-267.000.
Hessemer, Robert A., Jr.; and Perper, Lloyd J., to Hessemer, Robert A., Jr.; Perper, Lloyd J.; and Bowen, Theodore. Correlation thermography. 4,416,552., Cl. 374-117.000.
Hettiche, Albert: *See*—
Oeder, Dieter; Dietsche, Wolfram; Weiss, Stefan; Ziegler, Walter; Kueppers, Peter; and Hettiche, Albert, 4,417,035., Cl. 526-208.000.
Hewlett-Packard Company: *See*—
Tribolet, David C.; and Kemplin, Richard M., 4,417,258., Cl. 346-139.00R.
Hickman, Clarence J.: *See*—
Cammack, Michael A.; Elkins, Christopher W.; Hickman, Clarence J.; and Mullins, Keith M., 4,416,628., Cl. 433-80.000.
Higo, Shoichi: *See*—
Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,417,153., Cl. 307-140.000.
Hikosaka, Shinichi: *See*—
Tachibana, Eiichi; and Hikosaka, Shinichi, 4,416,215., Cl. 118-642.000.
Hillberg, Robert L., to COP, Inc. Handgun. 4,416,078., Cl. 42-69.00R.
Hille, Martin: *See*—
Bohm, Roland; and Hille, Martin, 4,416,796., Cl. 252-338.000.
Hills, Michael; Durret, Clay; and Von Meister, William, to Digital Broadcasting Corporation. SCA Data transmission system with a raised cosine filter. 4,417,349., Cl. 375-60.000.
Hines, David A.: *See*—
Bailey, Martin; Hines, David A.; Ousby, John C.; Roesler, Frank C., deceased; and Roesler, Johanna M., executrix, 4,416,781., Cl. 210-629.000.
Hinson, Ashford J. Method and apparatus for raising the ram of a vertical milling machine. 4,416,042., Cl. 29-57.000.
Hirabayashi, Takeo: *See*—
Matsuda, Tsutomu; Hirabayashi, Takeo; Yanagihara, Takeshi; and Sakurai, Shinjiro, 4,416,967., Cl. 430-159.000.
Hirahata, Shigeru; Takezawa, Teruhiro; Onuki, Nobuo; Komatsu, Shigeru; and Tachiuchi, Tsuguji, to Hitachi, Ltd. Arrangement for control of the operation of a random access memory in a data processing system. 4,417,318., Cl. 364-900.000.
Hirano, Takashi, to Yamata Scale Company, Ltd. Combination weighing machine. 4,416,341., Cl. 177-25.000.
Hirasawa, Hidenao: *See*—
Hiroshima, Soichi; Hirasawa, Hidenao; Nakasai, Yoshinori; and Takayama, Keiichi, 4,416,442., Cl. 266-44.000.
Hirata, Akio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for controlling alternating current motors. 4,417,193., Cl. 318-803.000.
Hiromi, Fukuoka; Matsuo, Masataka; Hamai, Kazuo; Hatta, Tokuaki; and Sugawara, Mituo, to Nippon Steel Corporation; and Kurosaki Yogyo Co., Ltd. Refractory powder flame projection moldings. 4,416,999., Cl. 501-94.000.
Hirose, Yukimi; Enami, Ken; and Wada, Kinzo, to Victor Company of Japan, Limited. Commutatorless electrical motor having sub magnetic poles. 4,417,186., Cl. 318-254.000.
Hiroshima, Soichi; Hirasawa, Hidenao; Nakasai, Yoshinori; and Takayama, Keiichi, to Nippon Steel Corporation. Method and apparatus for removing slag. 4,416,442., Cl. 266-44.000.
Hirotani, Yasunari; and Tanaka, Yoshimitsu, to Toyo Kogyo Co., Ltd. Sliding roof structure for automobile bodies. 4,416,487., Cl. 296-222.000.
Hirschberg, Eugene H.: *See*—
Udovich, Carl A.; Hirschberg, Eugene H.; and Bertolacini, Ralph J., 4,416,803., Cl. 502-209.000.
Hitachi Denshi Kabushiki Kaisha: *See*—
Ishikura, Masao, 4,417,287., Cl. 360-71.000.
Hitachi, Ltd.: *See*—
Asano, Atsushi; Takeshita, Masatoshi; Nishida, Hideki; Suzuki, Ryo; and Futami, Toshio, 4,417,323., Cl. 365-1.000.
Fujimura, Takashi; and Kato, Kazuo, 4,417,179., Cl. 315-151.000.
Fukui, Hiroshi; Kimura, Shin; Onda, Kenichi; and Amano, Hisao, 4,417,156., Cl. 307-252.00C.
Hirahata, Shigeru; Takezawa, Teruhiro; Onuki, Nobuo; Komatsu, Shigeru; and Tachiuchi, Tsuguji, 4,417,318., Cl. 364-900.000.
Kishi, Tuneo; Takeda, Yasuhide; Tsubaki, Toru; and Takahashi, Takeshi, 4,417,111., Cl. 200-148.00R.
Saito, Shozo; and Suzumura, Takeshi, 4,416,847., Cl. 376-253.000.
Shinkawa, Keiro; Matsuura, Shigeo; Sodeyama, Chuichi; Noda, Masaki; and Kondo, Masakazu, 4,417,279., Cl. 358-195.100.

Tokunaga, Kazuyoshi; and Anzai, Masayasu, 4,416,533., Cl. 355-4.000.
Tomioka, Shunzo; Okano, Kinpei; Matsuo, Masanori; Hasegawa, Akira; and Kitamura, Akira, 4,416,555., Cl. 384-415.000.
Tonomura, Kenichi; Kadokawa, Shigeru; and Ohsawa, Michinao, 4,417,277., Cl. 358-177.000.
Hitachi Microcomputer Engineering, Ltd.: *See*—
Tonomura, Kenichi; Kadokawa, Shigeru; and Ohsawa, Michinao, 4,417,277., Cl. 358-177.000.
Hobby, William M.; and Valdespino, Joseph M. Internal combustion engine. 4,416,224., Cl. 123-3.000.
Hobo, Nobuhito: *See*—
Shiozaki, Makoto; Haseda, Satoshi; Tarui, Jun; Ito, Osamu; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Kawai, Shizuo; and Sami, Hiroshi, 4,416,232., Cl. 123-357.000.
Hodshire, Vincent B.. Fishing apparatus. 4,416,079., Cl. 43-15.000.
Hoechst Aktiengesellschaft: *See*—
Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., 4,416,808., Cl. 252-547.000.
Bohm, Roland; and Hille, Martin, 4,416,796., Cl. 252-338.000.
Disselbeck, Dieter, 4,416,780., Cl. 210-617.000.
Martini, Thomas; Frischkorn, Hans; Schinzel, Erich; and Probst, Heinz, 4,416,795., Cl. 252-301.230.
Schell, Loni, 4,416,976., Cl. 430-331.000.
Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Davis, Larry; and Klein, Joseph T., 4,416,887., Cl. 424-267.000.
Lee, Thomas B. K.; Lee, George E.; and Jobin, Gregory M., 4,417,063., Cl. 549-354.000.
Hoepke, Carl-Heinz: *See*—
Huster, Heinrich; Meuser, Friedrich; and Hoepke, Carl-Heinz, 4,416,701., Cl. 127-68.000.
Hoff, Stephen J., to Hoffco, Inc. Lawn mower blade control mechanism. 4,416,107., Cl. 56-11.300.
Hoffco, Inc.: *See*—
Hoff, Stephen J., 4,416,107., Cl. 56-11.300.
Hoffman, David L., to General Electric Company. Magnetic friction device. 4,417,356., Cl. 378-181.000.
Hoffman, David M.; Loomis, Neil W.; Ehlert, Ralph C.; and Shelley, Peter S., to General Electric Company. Modular solid-state detector cell. 4,417,144., Cl. 250-367.000.
Hoffman, Leslie J. Indicator device with calibration means. 4,416,211., Cl. 116-204.000.
Hoffman, Virginia M.: *See*—
Chang, Philip Y.; and Hoffman, Virginia M., 4,417,321., Cl. 364-900.000.
Hoffmann, Wolfgang, to B & H Manufacturing Company, Inc. Labeling machine for heat shrink labels. 4,416,714., Cl. 156-86.000.
Hofmann, Peter, to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co. Closure for tire chains. 4,416,319., Cl. 152-213.00R.
Hogg, Grady R., Jr.; and Tanner, Nathan S., to Great Lakes Carbon Corporation. Composite electrode for arc furnace. 4,417,344., Cl. 373-93.000.
Hohn, Marlin W. Tool bar carrier with castering wheels. 4,416,336., Cl. 172-386.000.
Hokkai Can Co., Ltd.: *See*—
Takeda, Minoru; Nitta, Toshimi; and Saito, Hitoshi, 4,416,390., Cl. 220-273.000.
Holland, Frank S., to Manchem Limited. Electrolysis using two electrolytically conducting phases. 4,416,743., Cl. 204-59.00R.
Holyman, Brian T.; and Baty, Charlton R., to Decca Limited. Adjustable and selective electrical filters and methods of tuning them. 4,417,220., Cl. 333-174.000.
Holz, Wolfgang. Process and apparatus for feeding poultry. 4,416,218., Cl. 119-18.000.
Holzwarth, Dietmar H.: *See*—
Rieger, Hansjorg; and Holzwarth, Dietmar H., 4,416,318., Cl. 152-213.00A.
Homeyer, Bernhard: *See*—
Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,416,832., Cl. 260-940.000.
Honeywell Inc.: *See*—
Demark, Anthony M.; and Erhardt, William K., 4,416,156., Cl. 73-727.000.
Kim, Kwang-Yil, 4,416,551., Cl. 374-31.000.
Popard, Earl E.; Sedlar, Michael F.; and Davidson, Gary W., 4,417,183., Cl. 315-291.000.
Sanford, Herbert F., 4,416,355., Cl. 188-185.000.
Honeywell Information Systems Inc.: *See*—
Chimienti, Domenico; and Vercesi, Arturo, 4,417,302., Cl. 364-200.000.
Hook, Richard G.: *See*—
Greig, Colin C.; and Hook, Richard G., 4,416,295., Cl. 131-364.000.
Hoover Company, The: *See*—
Specht, Glenn E., 4,416,033., Cl. 15-339.000.
Horch, Werner: *See*—
Bugener, Franz; Rinklake, Manfred; Horch, Werner; Rottger, Wilhelm; Jost, Gunter; and Kirsch, Johann, 4,416,094., Cl. 52-72.000.
Horiuchi, Naoya; Ohhara, Takafumi; and Sano, Reiji, to Matsushita Electric Industrial Company, Limited. Method for producing discharge in gas laser at low voltage. 4,417,340., Cl. 372-58.000.
Horiuchi, Tatsuo, to Ushio Denki Kabushiki Kaisha; and Kabushiki Kaisha Meiko Shokai. Apparatus for covering base sheet surface. 4,416,719., Cl. 156-359.000.
Horn & Gladden Lint Cleaner Company, Inc.: *See*—
Schwartz, Robert C., 4,416,035., Cl. 19-0.200.
Horwinski, E. Robert, to Gulf & Western Manufacturing Company. Reciprocal pump with improved valve. 4,416,591., Cl. 417-241.000.
Hosaka, Akio: *See*—
Takase, Sadao; and Hosaka, Akio, 4,416,239., Cl. 123-478.000.
Hoshimi, Susumu; and Kojima, Tadashi, to Sony Corporation; and Tokyo Shibaura Denki Kabushiki Kaisha. Digital signal processing system. 4,417,283., Cl. 358-310.000.
Hotchandani, Kanayo: *See*—
Hulyalkar, Ramchandra K.; Baum, Gerald A.; and Hotchandani, Kanayo, 4,417,015., Cl. 524-139.000.
Hounsfield, Godfrey N., to Picker International Limited. Nuclear magnetic resonance apparatus. 4,417,209., Cl. 324-309.000.
Houvig, Felix J.: *See*—
Korowitz, Simon; Leichter, Kurt R.; and Houvig, Felix J., 4,417,303., Cl. 364-200.000.
Howard, Thomas L. Rescue signal. 4,416,212., Cl. 116-210.000.
Hsiung, Hansen M., to Eli Lilly and Company. Process for isolating oligonucleotide product from a coupling reaction mixture. 4,417,046., Cl. 536-27.000.
Huber, Bernhard, to Bodenseewerk Perkin-Elmer & Co., GmbH. Procedure for the enrichment of the element of interest from a solution for nonflame atomic absorption spectroscopy. 4,416,736., Cl. 204-1.00T.
Hudson Lock, Inc.: *See*—
Thimot, Robert P., 4,416,129., Cl. 70-369.000.
Hudson Oxygen Therapy Sales Company: *See*—
Havstad, Harold R., 4,416,270., Cl. 128-53.000.
Huebscher, David A., to Noral, Inc. Temperature-sensing apparatus. 4,416,553., Cl. 374-165.000.
Hughes Aircraft Company: *See*—
Figueroa, Luis; and Yen, Huan-Wun, 4,416,053., Cl. 29-572.000.
Hughes Tool Company: *See*—
Regan, Albert M., 4,416,495., Cl. 339-16.00C.
Hugues, Edgard A.; Bacchus, Jean-Marie; and Haisma, Jan, to U.S. Philips Corporation. Objective comprising aspherical surfaces, whose focal length is variable over a wide range. 4,416,518., Cl. 350-427.000.
Hulett, Frederic M., III: *See*—
Newton, David W.; Hulett, Frederic M., III; and Ovens, Christopher, 4,416,277., Cl. 128-303.130.
Hulin, Jean P.; Bouvard, Andre; and Le Maitre, Patrick, to Lignes Telegraphiques et Telephoniques. Method for in situ splicing optical fiber cables. 4,416,507., Cl. 350-96.220.
Hulyalkar, Ramchandra K.; Baum, Gerald A.; and Hotchandani, Kanayo, to Dart Industries Inc. Low toxic polyvinylchloride stabilizers. 4,417,015., Cl. 524-139.000.
Humphrey, John W.; and Silbernagel, Raymond A., to Magnetic Controls Company. Wire insertion tool. 4,416,059., Cl. 29-751.000.
Hung, Michael. Overload detecting device. 4,417,236., Cl. 340-626.000.
Hung, William M.: *See*—
Schmidt, Paul J.; and Hung, William M., 4,417,059., Cl. 548-456.000.
Hunsinger, Bill J., to Harris Corporation. Surface acoustic wave device having improved multi-strip coupler. 4,417,221., Cl. 333-194.000.
Hunter, Lee. Method of and apparatus for aligning vehicle front and rear wheels. 4,416,065., Cl. 33-203.150.
Hurst, Roger W. Ladder bar dial. 4,416,064., Cl. 33-181.0AT.
Huss, Rolf: *See*—
Kramer, Klaus; and Huss, Rolf, 4,416,165., Cl. 74-70.000.
Husson, Alan L.; and Uherek, Vladimir, to Westinghouse Electric Corp. Elevator system. 4,416,352., Cl. 187-29.00R.
Huster, Heinrich; Meuser, Friedrich; and Hoepke, Carl-Heinz, to Westfalia Separator AG. Method of producing starch from grain or ground grain products by the wet process. 4,416,701., Cl. 127-68.000.
Hutchinson, Martin A.: *See*—
Harra, David J.; Turner, Frederick T.; and Hutchinson, Martin A., 4,416,759., Cl. 204-298.000.
Huther, Werner, to MTU Motoren-und Turbinen-Union Munchen GmbH. Ceramic combustion chamber and method of making it. 4,416,621., Cl. 431-352.000.
Huve, Pierre M. Use of isopropylaminopyrimidine in the chemotherapy of muscular dystrophy, myopathy and myotonia. 4,416,885., Cl. 424-251.000.
Hydroil, Inc.: *See*—
Gallagher, John P., Jr., 4,416,610., Cl. 431-4.000.
I.T.S. S.r.l.: *See*—
Deregibus, Alfio, 4,416,721., Cl. 156-428.000.
Ichigaya, Hiroshi, to Sony Corporation. Wave synthesizing apparatus. 4,416,180., Cl. 84-1.230.
Ichikawa, Kaoru, to Sawafuji Electric Company, Ltd. Horizontal type vibrating compressor. 4,416,594., Cl. 417-360.000.
Ichikawa, Takashi; and Moriyama, Sadao, to Ikeda Bussan Co., Ltd. Method of producing interior material of corrugated cardboard. 4,416,716., Cl. 156-245.000.
Ichimura, Seiji: *See*—
Kinase, Takashi; Ichimura, Seiji; Kinjo, Yoshio; and Matsumoto, Yosuke, 4,416,742., Cl. 204-47.000.
Ickes, John C. Apparatus for controlling flow of combustion products. 4,416,253., Cl. 126-292.000.
Ieda, Nobuaki: *See*—
Otsuki, Yoshio; Uesugi, Masaru; and Ieda, Nobuaki, 4,417,163., Cl. 307-475.000.
Igarashi, Akira; and Nakamura, Sukenori, to Fuji Photo Film Co., Ltd. Heat-sensitive recording paper. 4,416,939., Cl. 428-323.000.

Ignasiak, Marty C.: *See—*
Bender, Ernest S.; Ignasiak, Marty C.; and Jones, Michael H., 4,416,604., Cl. 425-183.000.

Iida, Koso, to Toyo Kogyo Co., Ltd. Internal combustion engine with supercharger. 4,416,115., Cl. 60-600.000.

Iinuma, Hironobu: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Iinuma, Hironobu; and Kunimoto, Setsuko, 4,416,899., Cl. 424-320.000.

Iinuma, Kazuhiro; Seo, Yasutsugu; and Sato, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic blood flow measuring apparatus. 4,416,286., Cl. 128-663.000.

Iizumi, Toyoko: *See—*
Arai, Kazutaka; Ohara, Yoshio; Takakuwa, Yasuo; and Iizumi, Toyoko, 4,417,070., Cl. 560-56.000.

Ikarus Karoszseria es Jarmugyar: *See—*
Szendrodi, Valer; and Gyurics, Karoly, 4,416,435., Cl. 244-114.00R.

Ikeda Bussan Co., Ltd.: *See—*
Ichikawa, Takashi; and Moriyama, Sadao, 4,416,716., Cl. 156-245.000.

Ikeda, Kenji: *See—*
Ogawa, Yoshinari; Akagi, Noriyuki; Ikeda, Kenji; and Nakamura, Yoichi, 4,417,018., Cl. 524-261.000.

Ikeda, Mikio; and Tomizawa, Takayuki, to Fujizoki Pharmaceutical Co. Ltd. Artificial carrier for immobilization of biological proteins. 4,416,813., Cl. 260-117.000.

Ikeda, Osamu: *See—*
Konno, Masashi; and Ikeda, Osamu, 4,416,605., Cl. 425-185.000.

Ikeda, Shoji: *See—*
Sakamoto, Fumio; Ikeda, Shoji; and Tsukamoto, Goro, 4,416,891., Cl. 424-270.000.

Ikeura, Kenji, to Nissan Motor Co., Ltd. Ignition system spark timing control during engine cranking. 4,416,234., Cl. 123-424.000.

ILC Data Device Corporation: *See—*
Shepard, Leonard F., 4,417,352., Cl. 377-43.000.

Illinois Tool Works Inc.: *See—*
Herron, John R., Jr., 4,417,294., Cl. 361-288.000.

Imamura, Nobutake: *See—*
Tanaka, Shinsuke; Imamura, Nobutake; and Ota, Chuichi, 4,417,290., Cl. 360-131.000.

Imamura, Noriaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hose joint with a sheltering cover. 4,416,227., Cl. 123-198.00D.

Imperial Chemical Industries PLC: *See—*
Bailey, Derrick S.; and Griffin, Brian P., 4,417,020., Cl. 524-502.000.
Bailey, Martin; Hines, David A.; Ousby, John C.; Roesler, Frank C., deceased; and Roesler, Johanna M., executrix, 4,416,781., Cl. 210-629.000.
Cogswell, Frederic N.; Griffin, Brian P.; and Smith, Clive P., 4,417,043., Cl. 528-176.000.
Worthington, Paul A., 4,416,682., Cl. 71-76.000.

Imperial Clevite Inc.: *See—*
Benincasa, Timothy C., 4,417,170., Cl. 310-345.000.
Coad, L. Dale, 4,416,445., Cl. 267-35.000.

Inaba, Hajimu; and Nihei, Ryo, to Fujitsu Fanuc Limited. Robot hand of an industrial robot. 4,416,577., Cl. 414-226.000.

Inanaga, Takugi: *See—*
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,416,432., Cl. 242-199.000.

Inata, Hiroo; and Matsumura, Shunichi, to Teijin Limited. Wholly aromatic polyester composition, process for production thereof, and production therefrom of a film-like or fibrous article of a wholly aromatic polyester. 4,416,839., Cl. 264-49.000.

Indelicato, Venerando J.: *See—*
Carlson, Alan J.; and Indelicato, Venerando J., 4,417,100., Cl. 179-5.00R.

Inden, Peter: *See—*
Heitkamp, Dieter; and Inden, Peter, 4,416,860., Cl. 423-6.000.

Industrial Management Co.: *See—*
Rooklyn, Jack, 4,416,202., Cl. 104-88.000.

Industrial Metal Products Corporation: *See—*
Judge, Edward E., Jr., 4,416,130., Cl. 72-10.000.

Infrarodteknik AB: *See—*
Nilsson, Hans E.; and Carlsson, Ake, 4,416,068., Cl. 34-4.000.

Ingle, William M.; Darnell, Robert D.; and Thompson, Stephen W., to Motorola, Inc. Ascending differential silicon harvesting means and method. 4,416,913., Cl. 427-45.100.

Inland Steel Company: *See—*
Martin, Frank A., 4,416,756., Cl. 204-206.000.

Innovative Medical Systems, Corp.: *See—*
Williams, Robert C., 4,416,153., Cl. 73-295.000.

Inoue, Michihiro; Takemoto, Toyoki; and Yamada, Haruyasu, to Matsushita Electric Industrial Co., Ltd. Fully parallel threshold type analog-to-digital converter. 4,417,233., Cl. 340-347.0AD.

Inoue, Osamu: *See—*
Nakada, Minoru; Shimma, Yashiro; Inoue, Osamu; and Suma, Sei, 4,416,327., Cl. 165-122.000.

Inoue, Takashi: *See—*
Nagao, Nobuya; and Inoue, Takashi, 4,417,270., Cl. 358-23.000.

Inoue, Tetsuyu: *See—*
Minagawa, Motonobu; Inoue, Tetsuyu; and Kurita, Naoyasu, 4,416,797., Cl. 252-400.00A.

Inoue, Yoshikazu: *See—*
Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, 4,416,879., Cl. 424-246.000.

Inoue, Yuzuru; Shinozaki, Takashi; Otake, Yoshichi; and Ono, Shinsuke, to Victor Company of Japan, Limited. Color television camera having a color separation crossing striped filter. 4,417,272., Cl. 358-44.000.

Institut Elektrosvarki, Imeni E.O. Patona: *See—*
Kuchuk-Yatsenko, Sergei I.; Bogorsky, Mikhail V.; and Samotryasov, Sergei M., 4,417,121., Cl. 219-104.000.

Institut Francais du Petrole: *See—*
Gaillard, Jean, 4,417,091., Cl. 585-823.000.
Rinaudo, Marguerite; Milas, Michel; and Kohler, Norbert, 4,416,990., Cl. 435-104.000.

Institute of Gas Technology: *See—*
Vorres, Karl S., 4,416,857., Cl. 422-145.000.

Institute Po Technicheska Kibernetika I Robotika: *See—*
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Makabe, Hachiro; Tanaka, Haruhiko; and Orii, Akira, 4,417,188., Cl. 318-696.000.

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Serres, Bernard M.; Viale, Maurice S.; and Jewiarz, Edouard J., 4,417,101., Cl. 179-8.00R.

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Norioka, Setsuo, 4,417,145., Cl. 250-396.0ML.

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Johnson, Robert A., to Tannetics, Inc. Unitary removable refrigeration system and cooler. 4,416,122., Cl. 62-448.000.

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Lacy, Ray S., Jr.; and Johnson, Thomas P., 4,416,210., Cl. 114-67.00A.

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McCaffrey, David J. A.; and Jones, William D., deceased, 4,416,769., Cl. 209-166.000.

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Goodstine, Stephen L.; and Jones, Brian C., 4,416,418., Cl. 237-19.000.

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Miller, Timothy J. E.; and Jones, Donald W., 4,417,168., Cl. 310-156.000.

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Bender, Ernest S.; Ignasiak, Marty C.; and Jones, Michael H., 4,416,604., Cl. 425-183.000.

Jones, Thaddeus M., to Dresser Industries, Inc. Zero crossover triggering circuit for thyristor. 4,417,199., Cl. 323-319.000.

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Josefsson, Paul W.: *See*—
Carre, Olof G.; Josefsson, Paul W.; Nasman, Lars E.; and Zetterqvist, Stig B. H., 4,416,548., Cl. 366-168.000.

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Bugener, Franz; Rinklake, Manfred; Horch, Werner; Rottger, Wilhelm; Jost, Gunter; and Kirsch, Johann, 4,416,094., Cl. 52-72.000.

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Yamato, Noboru; Hasegawa, Akira; and Shimizu, Ippei, 4,416,471., Cl. 282-27.500.

Julian, Gary: *See*—
Loye, Kenneth; and Julian, Gary, 4,416,940., Cl. 428-324.000.

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Liessem, Bernhard, 4,417,002., Cl. 521-128.000.

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Matsuura, Yoshiaki, 4,417,263., Cl. 357-23.000.

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Konno, Masashi; and Ikeda, Osamu, 4,416,605., Cl. 425-185.000.

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Yanagisawa, Hifumi; Warabi, Junichi; and Sakuma, Shinzo, 4,417,110., Cl. 200-144.00B.

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Kamei, Taketo; Hayashi, Motokazu; Osada, Kimio; and Kimura, Mitsutoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Compact fluorescent lamp. 4,417,176., Cl. 315-59.000.

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Elmore, Carl L.; and Funk, Erwin D., 4,416,567., Cl. 406-63.000.

Kan, Masanori; Okazaki, Takuya; and Sakashita, Tatsuo, to Toyo Rubber Industry Co., Ltd., The. Rubber composition for side wall of tire. 4,417,027., Cl. 525-99.000.

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Kanazuka, Yasuo: *See*—
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Kanbe, Junichiro: *See*—
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Sakamoto, Fumio; Ikeda, Shoji; and Tsukamoto, Goro, 4,416,891., Cl. 424-270.000.

Kaneko, Yutaka: *See*—
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Giler, Roger R., 4,417,346., Cl. 373-137.000.

Kanto Yakin Kogyo Kabushiki Kaisha: *See*—
Takahashi, Susumu, 4,416,623., Cl. 432-36.000.

Kaplan, Murray A.; and Shinal, Edward C., to Bristol-Myers Company. Injectable compositions of BBM-928A. 4,416,874., Cl. 424-177.000.

Kapp, Gerald E., to General Motors Corporation. Electro-hydraulic control for a transmission having a torque converter clutch. 4,416,358., Cl. 192-3.320.

Karanewsky, Donald S.; and Petrillo, Edward W., Jr., to E. R. Squibb & Sons, Inc. Substituted carbonyl phosphinyl-alkanoyl compounds. 4,416,833., Cl. 260-941.000.

Karliner, Rudolf, to Wagner Spray Tech Corporation. Air compressor for paint pumps. 4,416,588., Cl. 417-199.00R.

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Brown, Glenn E.; Karpetsky, Timothy P.; and Jewett, Phillip, 4,416,761., Cl. 204-299.00R.

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Kasai, Masao: *See*—
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Kaster, Robert L. Trileaflet prosthetic heart valve. 4,416,029., Cl. 3-1.500.

Kastl, Alfons, to AGFA-Gevaert Aktiengesellschaft. Racks for developing and/or fixing film. 4,416,529., Cl. 354-320.000.

Kastl, Hans; and Gugel, Georg, to Kraftwerk Union Aktiengesellschaft. Nuclear power plant with cooling circuit. 4,416,846., Cl. 376-249.000.

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Fujimura, Takashi; and Kato, Kazuo, 4,417,179., Cl. 315-151.000.

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Ito, Akihiko; Tanaka, Hisami; Takayama, Yoshihisa; and Kato, Seiji, 4,417,158., Cl. 307-269.000.

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Kaufman, Benjamin J.; Sung, Rodney L.; and Sweeney, William M., to Texaco Inc. Methanol, ethanol, or gasohol fuel containing as a wear-inhibiting additive a reaction product of an ether-amine with a phosphate or a substituted phosphonic acid. 4,416,667., Cl. 44-56.000.

Kaufman, Joseph, to Becton Dickinson and Company. Multiple sample needle assembly with vein entry indicator. 4,416,291., Cl. 128-766.000.

Kauschus, Fritz: *See*—
Beck, Wilfried; and Kauschus, Fritz, 4,416,918., Cl. 427-296.000.

Kawabata, Takashi, to Canon Kabushiki Kaisha. Automatic focusing system. 4,416,523., Cl. 354-25.000.

Kawachi, Kazuhiko: *See*—
Kamijo, Yoshimi; and Kawachi, Kazuhiko, 4,417,174., Cl. 313-502.000.

Kawai, Hiroshi, to Daiwa Seiko Inc. Spinning reel for fishing. 4,416,427., Cl. 242-84.20R.

Kawai, Shizuo: *See*—
Shiozaki, Makoto; Haseda, Satoshi; Tarui, Jun; Ito, Osamu; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Kawai, Shizuo; and Sami, Hiroshi, 4,416,232., Cl. 123-357.000.

Kawai, Yasuhiro; Okamoto, Yoshihiko; Yamamoto, Takaaki; and Kato, Hisatoyo, to Fuji Photo Film Co., Ltd. Image scanning system. 4,417,260., Cl. 346-160.000.

Kawamata, Kiyoshi. Method of forming score in can end plate and method of attaching tab to the same for facilitating the opening of can. 4,416,576., Cl. 413-12.000.

Kawasaki, Masahiro: *See*—
Fujii, Setsuro; Yasui, Bompei; Nakamura, Mitsuo; Miyamoto, Tomohisa; Ando, Kazuko; Hashimoto, Iwao; Sawai, Yoneichi;

Umeda, Naoki; and Kawasaki, Masahiro, 4,416,875., Cl. 424-180.000.
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Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,416,980., Cl. 430-567.000.
Kawasaki, Shozo: *See*—
Narita, Kiichi; Tomita, Akitsu; Katagiri, Nozomu; Seki, Kazuyuki; Sato, Tetuo; Kitamura, Minoru; Kawasaki, Shozo; and Kanazuka, Yasuo, 4,416,691., Cl. 75-60.000.
Kaze, Akira, to Eagle Industry Co., Ltd. Automatic piping machine. 4,416,204., Cl. 112-68.000.
Kehl, Charles W. Waste material compactor apparatus. 4,416,197., Cl. 100-214.000.
Keiper Recaro GmbH: *See*—
Wall, Helmut, 4,416,488., Cl. 297-411.000.
Kelleher, Kevin C., to RCA Corporation. Turntable speed control. 4,417,332., Cl. 369-266.000.
Keller, Heinz: *See*—
Bapst, Urs; Keller, Heinz; Meyr, Heinrich; and Muller, Hans R., 4,417,242., Cl. 340-825.050.
Keller, Jack K.; and Mowery, Gilbert L., Jr., to Bell Telephone Laboratories, Incorporated. Tri-state logic buffer circuit. 4,417,162., Cl. 307-473.000.
Keller, Patrick N.; Franck, Jerome B.; and Silberberg, George G., to United States of America, Navy. Laser formed video tube calibration markers. 4,417,123., Cl. 219-121.0LH.
Kelly, Joseph B., to PPG Industries, Inc. Treating glass sheets to heal vents that result in breakage during thermal treatment. 4,416,930., Cl. 428-137.000.
Kelly, Michael J.; Lindsay, Robert L.; Kobylar, Alex W.; and Stelte, David J., to GTE Automatic Electric Labs Inc. Digital satellite telephone office. 4,417,335., Cl. 370-110.100.
Kelly, William R.: *See*—
Alvero, Ernesto J.; and Kelly, William R., 4,416,521., Cl. 354-1.000.
Kemp, David M., to FMC Corporation. Beverage pasteurizing system. 4,416,194., Cl. 99-275.000.
Kemplin, Richard M.: *See*—
Tribolet, David C.; and Kemplin, Richard M., 4,417,258., Cl. 346-139.00R.
Kennecott Corporation: *See*—
Richards, Kenneth J.; and George, David B., 4,416,690., Cl. 75-26.000.
Sinek, Joachim R., 4,416,836., Cl. 261-112.000.
Kenrich Petrochemicals, Inc.: *See*—
Sugerman, Gerald; and Monte, Salvatore J., 4,417,009., Cl. 523-451.000.
Kepes, Andre; Weynant, Eric; Avenas, Pierre; and Haudin, Jean-Marc, to Societe Chimique des Charbonnages-CdF Chimie. Process for shaping solid polybut-1-ene and the resulting shaped articles. 4,417,041., Cl. 526-348.600.
Kerby, Robert C.; and Krauss, Clifford J., to Cominco Ltd. Bipolar refining of lead. 4,416,746., Cl. 204-114.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Heitkamp, Dieter; and Inden, Peter, 4,416,860., Cl. 423-6.000.
Kerres, Bruno, to Girmes-Werke AG. Method for separating oil from aqueous or solvent dispersions. 4,416,782., Cl. 210-634.000.
Kessler, John R., to Monarch Marking Systems, Inc. Ink roller assembly with capillary ink supply. 4,416,201., Cl. 101-348.000.
Kessler Products Co., Inc.: *See*—
Ullman, Myron E., 4,416,481., Cl. 294-87.200.
Ketchum, Elmer, Jr. Fuel burner construction. 4,416,615., Cl. 431-285.000.
Khanna, Yash P.; Turi, Edith A.; Aharoni, Shaul M.; and Largman, Theodore, to Allied Corporation. Quasi-random copolymers from homopolymers. 4,417,032., Cl. 525-432.000.
Kicher, Thomas P.: *See*—
Bowman, Harold M.; and Kicher, Thomas P., 4,416,440., Cl. 249-82.000.
Kijimuta, Hitoshi: *See*—
Sato, Kimihiko; Terase, Kunihiko; Kijimuta, Hitoshi; and Ohta, Yukinori, 4,416,863., Cl. 423-344.000.
Killat, George R.; and Wilson, Larry R., to Dow Chemical Company, The. Ammonium polyamidoamines. 4,416,729., Cl. 162-164.300.
Kilts, Harold J.; and Swaziek, Laurence J., to Madison Farm Structures, Inc. Material discharge apparatus with improved discharge tube. 4,416,362., Cl. 193-25.00C.
Kim, Kwang-Yil, to Honeywell Inc. Battery microcalorimeter. 4,416,551., Cl. 374-31.000.
Kimura, Akio; Wada, Osamu; Owaki, Shinji; and Seimitsu, Kozo, to Teijin Limited. Woven or knitted polyester multifilament fabric. 4,416,934., Cl. 428-224.000.
Kimura, Mitsutoshi: *See*—
Kamei, Taketo; Hayashi, Motokazu; Osada, Kimio; and Kimura, Mitsutoshi, 4,417,176., Cl. 315-59.000.
Kimura, Shin: *See*—
Fukui, Hiroshi; Kimura, Shin; Onda, Kenichi; and Amano, Hisao, 4,417,156., Cl. 307-252.00C.
Kinase, Takashi; Ichimura, Seiji; Kinjo, Yoshio; and Matsumoto, Yosuke, to Nippon Mining Co., Ltd.; and Nippon Metal Plating Co., Ltd. Process and electrolytic bath for making a rhodium-plated article having a black or blue color. 4,416,742., Cl. 204-47.000.
King, James D.: *See*—
Hagen, James M.; and King, James D., 4,416,630., Cl. 434-16.000.
King, Richard J. Clothes hanger. 4,416,401., Cl. 223-88.000.
King, Sterling J. Bottle holder. 4,416,438., Cl. 248-102.000.
Kinjo, Yoshio: *See*—
Kinase, Takashi; Ichimura, Seiji; Kinjo, Yoshio; and Matsumoto, Yosuke, 4,416,742., Cl. 204-47.000.
Kinoshita, Hidefumi: *See*—
Nagao, Susumu; Kurabayashi, Katsuhiko; Futamura, Nobuyuki; Kinoshita, Hidefumi; and Takahashi, Toshio, 4,416,819., Cl. 260-293.30B.
Kirby, Raymond L., to Buddy B. Simpson A/B Electronics. Electronic noise detectors. 4,416,155., Cl. 73-646.000.
Kirchen, Michel; Solvi, Marc; and Burton, Clement, to Paul Wurth S.A. Dust collector for furnace charging installation. 4,416,673., Cl. 55-267.000.
Kircher, Dieter: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Bleckmann, Hans-Wilhelm; and Weise, Lutz, 4,416,491., Cl. 303-113.000.
Kirita, Yasuzo: *See*—
Sato, Takashi; Mukai, Makoto; Nagata, Shiro; Harada, Yoshimichi; and Kirita, Yasuzo, 4,416,772., Cl. 210-137.000.
Kirsch, Johann: *See*—
Bugener, Franz; Rinklake, Manfred; Horch, Werner; Rottger, Wilhelm; Jost, Gunter; and Kirsch, Johann, 4,416,094., Cl. 52-72.000.
Kish, Paul. Paper roll dispenser. 4,416,425., Cl. 242-55.200.
Kishi, Tuneo; Takeda, Yasuhide; Tsubaki, Toru; and Takahashi, Takeshi, to Hitachi, Ltd. Three-phase combined type circuit breaker. 4,417,111., Cl. 200-148.00R.
Kishida, Kunio: *See*—
Morikawa, Masaki; Yoshida, Hideaki; Kishida, Kunio; and Tanaka, Chuji, 4,416,853., Cl. 420-469.000.
Kishita, Kazutaka: *See*—
Okamura, Yasuhumi; Masaoka, Aritatsu; and Kishita, Kazutaka, 4,417,040., Cl. 526-323.100.
Kissel, Thomas R., to Eastman Kodak Company. Diluent and method for potentiometric assay of liquids. 4,416,735., Cl. 204-1.00T.
Kitamura, Akira: *See*—
Tomioka, Shunzo; Okano, Kinpei; Matsuo, Masanori; Hasegawa, Akira; and Kitamura, Akira, 4,416,555., Cl. 384-415.000.
Kitamura, Hidetoshi; and Kato, Hirohisa, to Nissan Motor Co., Ltd. Method and device for detecting engine idling. 4,416,149., Cl. 73-118.000.
Kitamura, Minoru: *See*—
Narita, Kiichi; Tomita, Akitsu; Katagiri, Nozomu; Seki, Kazuyuki; Sato, Tetuo; Kitamura, Minoru; Kawasaki, Shozo; and Kanazuka, Yasuo, 4,416,691., Cl. 75-60.000.
Klasco, Michael A.: *See*—
Eppler, William G., Jr.; Klasco, Michael A.; and Kornfeld, Irwin H., 4,417,103., Cl. 369-60.000.
Klasen, Rudi: *See*—
Brown, Lloyd C.; and Klasen, Rudi, 4,416,859., Cl. 422-261.000.
Kleemann, Axel: *See*—
Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, 4,416,827., Cl. 260-501.120.
Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, 4,416,828., Cl. 260-501.120.
Klein, George; Manber, Solomon; Sudhalter, Marvin; and Taylor, Alvin, to Distributed Control Systems, Inc. Universal input-output device. 4,417,151., Cl. 307-24.000.
Klein, Joseph T.: *See*—
Davis, Larry; and Klein, Joseph T., 4,416,887., Cl. 424-267.000.
Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Diederich, Herbert; Gaffal, Karl; and Scherzer, Hugo, 4,416,586., Cl. 417-13.000.
Kleinberg, Leonard L., to United States of America, National Aeronautics and Space Administration. Tuned analog network. 4,417,215., Cl. 330-107.000.
Klimowicz, Jerome R. Multiple piece bolt-type fastener. 4,416,574., Cl. 411-397.000.
Klosa, Josef. [8-(Dialkylamino alkoxy)-caffeine]-platinum complex compounds and pharmaceutical products containing the same. 4,416,878., Cl. 424-245.000.
Kloss, Henry E., to Kloss Video Corporation. Video projection system. 4,417,273., Cl. 358-60.000.
Kloss Video Corporation: *See*—
Kloss, Henry E., 4,417,273., Cl. 358-60.000.
Kluger, Jacob N., to Xerox Corporation. Apparatus and method for registering copy sheets in a variable pitch reproduction machine. 4,416,534., Cl. 355-14.0SH.
Klus, John P.; Gibbons, Everett E.; Brodsky, Eric L.; and Janule, Victor P., to Madison-Kipp Corporation. Surface tensiometer. 4,416,148., Cl. 73-64.400.
Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, to Robert Bosch GmbH. Fuel injection system. 4,416,238., Cl. 123-470.000.
Knapp, Heinrich; Romann, Peter; and Sauer, Rudolf, to Robert Bosch GmbH. Mixture formation system for mixture-compressing internal combustion engines with externally supplied ignition. 4,416,241., Cl. 123-494.000.
Knickerbocker, Michael G., to Seaquist Valve Co., Div. of Pittway Corp. Variable spray overcap aerosol assembly. 4,416,398., Cl. 222-402.130.
Knight, Lindsay C., to Australasian Training Aids Pty. Ltd. Trolleys for target ranges. 4,416,456., Cl. 273-359.000.
Knoll, Frank: *See*—
Spinosa, Dominic J.; and Knoll, Frank, 4,416,641., Cl. 441-94.000.

Knopp, Hans: *See*—
Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, 4,416,041., Cl. 28-255.000.

Knorre, Helmut; Fischer, Joachim; and Stutzel, Klaus, to Degussa. Process for the treatment of continuous waste water streams having changing contents of different oxidizable materials with hydrogen peroxide. 4,416,786., Cl. 210-746.000.

Knothe, Erich; Blawert, Dieter; and Schubart, Bernd, to Sartorius GmbH. Electromechanical weigher. 4,416,343., Cl. 177-180.000.

Kobari, Yukio: *See*—
Hashimoto, Takafumi; and Kobari, Yukio, 4,416,953., Cl. 429-18.000.

Kobayashi, Masateru: *See*—
Shibuya, Chisei; Murakami, Masahiro; Kobayashi, Masateru; and Sone, Takanori, 4,417,047., Cl. 544-26.000.

Kobayashi, Ryuichiro: *See*—
Takahashi, Jiro; Komamura, Tawara; and Kobayashi, Ryuichiro, 4,416,979., Cl. 430-562.000.

Kobayashi, Shigeru: *See*—
Fukuda, Tsunehiko; Kobayashi, Shigeru; and Fujino, Masahiko, 4,416,820., Cl. 548-496.000.

Kobayashi, Shuichi: *See*—
Sugano, Junichiro; Kobayashi, Shuichi; Yui, Tomoyuki; Fujimoto, Tsuneo; and Kubota, Minoru, 4,416,606., Cl. 425-202.000.

Kobayashi, Yuko, to Olympus Optical Co., Ltd. Objective for video disks. 4,416,519., Cl. 350-475.000.

Kobe Steel, Ltd.: *See*—
Narita, Kiichi; Tomita, Akitsu; Katagiri, Nozomu; Seki, Kazuyuki; Sato, Tetuo; Kitamura, Minoru; Kawasaki, Shozo; and Kanazuka, Yasuo, 4,416,691., Cl. 75-60.000.

Kobylar, Alex W.: *See*—
Kelly, Michael J.; Lindsay, Robert L.; Kobylar, Alex W.; and Stelte, David J., 4,417,335., Cl. 370-110.100.

Koch, Adolf, to Autohaus Lorinser G.m.b.H., & Co. Arrangement for storing tools and instruments in power vehicles. 4,416,483., Cl. 296-37.100.

Koch Process Systems, Inc.: *See*—
Abrams, Richard F.; and Chellis, James G., 4,416,855., Cl. 422-111.000.

Kockums Industri A.B.: *See*—
Ostberg, Sven E., 4,416,312., Cl. 144-39.000.

Kocol, James E.: *See*—
Gunderson, Robert O.; Kocol, James E.; and Schuck, David B., 4,417,334., Cl. 370-85.000.

Koda, Yoshinobu; Ona, Isao; and Takeda, Atsushi, to Toray Silicone Company, Ltd. Fluorosilicone-containing compositions for the treatment of fibers. 4,417,024., Cl. 524-861.000.

Kodama, Fumio: *See*—
Nakao, Masaaki; and Kodama, Fumio, 4,416,784., Cl. 210-635.000.

Kodama, Tasuku; and Taruishi, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha; and Nippon Genshiryoku Jigyo Kabushiki Kaisha. System for cooling the atmosphere in a primary containment vessel in nuclear reactor and removing water-soluble gases and dusts floating therein. 4,416,850., Cl. 376-310.000.

Kohler, Norbert: *See*—
Rinaudo, Marguerite; Milas, Michel; and Kohler, Norbert, 4,416,990., Cl. 435-104.000.

Kohrn, Robert C., to Uniroyal, Inc. Reduced noise positive drive power transmission system. 4,416,649., Cl. 474-153.000.

Koivumaki, Markku: *See*—
Pesonen, Jori; and Koivumaki, Markku, 4,416,731., Cl. 162-308.000.

Kojima, Tadashi: *See*—
Hoshimi, Susumu; and Kojima, Tadashi, 4,417,283., Cl. 358-310.000.

Kojima, Toshio: *See*—
Sutoh, Shinji; Hara Toshizo; Sugiura, Hiroyuki; and Kojima, Toshio, 4,416,324., Cl. 165-12.000.

Kokusai Denshindenwa Co., Ltd.: *See*—
Tanaka, Shinsuke; Imamura, Nobutake; and Ota, Chuichi, 4,417,290., Cl. 360-131.000.

Koleske, Joseph V.: *See*—
France, Haywood G.; and Koleske, Joseph V., 4,416,917., Cl. 427-302.000.

Kollmann, Bernd: *See*—
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,416,409., Cl. 228-173.00R.

Kollmeier, Hans-Joachim; and Langenhagen, Rolf-Dieter, to Th. Goldschmidt AG. Process for the addition of organic silicon compounds with SiH groups to compounds with olefinic double bonds. 4,417,068., Cl. 556-479.000.

Kolt, Stanley, to Suroff, Leonard W., a part interest. Automatic damper assembly. 4,416,415., Cl. 236-49.000.

Komamura, Tawara: *See*—
Takahashi, Jiro; Komamura, Tawara; and Kobayashi, Ryuichiro, 4,416,979., Cl. 430-562.000.

Komatsu, Masato: *See*—
Yamamoto, Noboru; Morikubo, Keiichi; Komatsu, Masato; and Sei, Kazuo, 4,417,019., Cl. 524-456.000.

Komatsu, Shigeru: *See*—
Hirahata, Shigeru; Takezawa, Teruhiro; Onuki, Nobuo; Komatsu, Shigeru; and Tachiuchi, Tsuguji, 4,417,318., Cl. 364-900.000.

Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, to Pioneer Electronic Corporation. Cassette braking mechanism. 4,416,432., Cl. 242-199.000.

Kominami, Yasuhiko: *See*—
Ohya, Kazuo; Fujishima, Hiroki; Ishijima, Norio; Itoga, Hiroyoshi; and Kominami, Yasuhiko, 4,416,709., Cl. 148-403.000.

Komova, Marina L.: *See*—
Gelfand, Yakov E.; Komova, Marina L.; Shtengel, Eduard G.; and Yakovis, Leonid M., 4,416,394., Cl. 222-55.000.

Komyak, Nikolai I.: *See*—
Anisovich, Kliment V.; Komyak, Nikolai I.; and Menbaev, Zaurbek K., 4,417,355., Cl. 378-49.000.

Kondo, Masakazu: *See*—
Shinkawa, Keiro; Matsuura, Shigeo; Sodeyama, Chuichi; Noda, Masaki; and Kondo, Masakazu, 4,417,279., Cl. 358-195.100.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,416,980., Cl. 430-567.000.
Otake, Eiji, 4,417,148., Cl. 250-561.000.
Takahashi, Jiro; Komamura, Tawara; and Kobayashi, Ryuichiro, 4,416,979., Cl. 430-562.000.

Konno, Masashi; and Ikeda, Osamu, to Kabushiki Kaisha Kobe Seiko Sho. Screen/diverter changing mechanism for extruders. 4,416,605., Cl. 425-185.000.

Kooy, Wayne J.: *See*—
Wood, Douglas E.; Kooy, Wayne J.; and Unger, Lawrence C., 4,416,560., Cl. 400-705.100.

Kornfeld, Irwin H.: *See*—
Eppler, William G., Jr.; Klasco, Michael A.; and Kornfeld, Irwin H., 4,417,103., Cl. 369-60.000.

Korowitz, Simon; Leichter, Kurt R.; and Houvig, Felix J., to Leeds & Northrup Company. Multi-processor data communication bus structure. 4,417,303., Cl. 364-200.000.

Korth, John K. Apparatus and method for detecting and indicating misalignments of vehicle wire spoke wheels. 4,417,237., Cl. 340-686.000.

Korwill, Ferdinand C., to S. W. Hart & Co. Pty. Ltd. Solar water heaters. 4,416,256., Cl. 126-427.000.

Kostandian, Kliment A.: *See*—
Pelts, Boris B.; Tumasian, Beniamin A.; Egorov, Leonid P.; Zatulovsky, Lev M.; Chaikin, Peter M.; Freiman, Efim A.; Chalian, Eduard A.; Abramian, Grant I.; Azoian, Stepan E.; and Kostandian, Kliment A., 4,416,723., Cl. 156-608.000.

Kostinko, John A., to J. M. Huber Corporation. Synthesis of zeolites of small and uniform size having a high magnesium exchange capacity. 4,416,805., Cl. 502-67.000.

Kotanen, Jorma: *See*—
Vedenpa, Timo; Lindstrom, Yngve; Eskelinen, Pekka; and Kotanen, Jorma, 4,416,070., Cl. 34-114.000.

Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, to Dynamit Nobel AG. Method of cleaving organosiloxanes. 4,417,067., Cl. 556-467.000.

Kovacs, Tamas: *See*—
Szebenyi, Ferenc; Nemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, 4,416,566., Cl. 405-291.000.

Kowalski, Gunter: *See*—
Groh, Gunther; Weiss, Hermann; Wagner, Wolfgang; Pasedach, Klaus; Kowalski, Gunter; and Meyer-Ebrecht, Dietrich, 4,417,353., Cl. 378-4.000.

Koyama, Haruo: *See*—
Miyakawa, Nobuhiro; Teshima, Takashi; Koyama, Haruo; Maekawa, Kouji; and Fujii, Masanori, 4,416,964., Cl. 430-106.600.

Kraftwerk Union Aktiengesellschaft: *See*—
Kastl, Hans; and Gugel, Georg, 4,416,846., Cl. 376-249.000.

Kramer, Klaus; and Huss, Rolf, to Focke and Company. Stepping gear. 4,416,165., Cl. 74-70.000.

Kramer, Milo G., to Source Technologies Corporation. Slide projector having two image-projection systems which operate with a single slide tray. 4,416,520., Cl. 353-101.000.

Krause, Robert A. Truck and rail transportation system. 4,416,571., Cl. 410-53.000.

Krauss, Clifford J.: *See*—
Kerby, Robert C.; and Krauss, Clifford J., 4,416,746., Cl. 204-114.000.

Krauss, Rudolf; and Hafner, Udo, to Robert Bosch GmbH. Electromagnetically actuatable valve, in particular a fuel injection valve for fuel injection systems. 4,416,423., Cl. 239-585.000.

Krauss, Rudolf: *See*—
Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, 4,416,238., Cl. 123-470.000.

Kreicas, Leonard: *See*—
Muller, Peter; Mustacchi, Henry; and Kreicas, Leonard, 4,416,950., Cl. 428-537.000.

Krenn, Karl-Dieter: *See*—
Fischer, Wolfgang; and Krenn, Karl-Dieter, 4,416,997., Cl. 436-42.000.

Kretschmer, Stephen L., to A. O. Smith Harvestore Products, Inc. Apparatus for agitating and pumping a liquid slurry. 4,416,549., Cl. 366-190.000.

Kretz, Rolf H., to Process Engineering Company S.A. Method of continuous treatment of grain mash for producing ethanol. 4,416,989., Cl. 435-93.000.

Krimmel, Heinz. Mixer. 4,416,545., Cl. 366-99.000.

Kristiansson, Krister: *See*—
Malmqvist, Erik L.; and Kristiansson, Krister, 4,417,142., Cl. 250-253.000.

Krivoy, William A.: *See*—
Walter, Roderich W.; Krivoy, William A.; Ritzmann, Ronald F.; and Bhargava, Hemendra N., 4,416,871., Cl. 424-177.000.
Krogsrud, Harald, to Elkem a/s. Holder for an electrode. 4,417,345., Cl. 373-101.000.
Krueger, Ronald G., to Proform, Inc. Multilayer stitched knitted fiberglass composite. 4,416,929., Cl. 428-102.000.
Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Cyanoalkylphosphoric acid ester chlorides. 4,416,832., Cl. 260-940.000.
Krupanszky, Jozsef: *See*—
Szebenyi, Ferenc; Nemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, 4,416,566., Cl. 405-291.000.
Kruse, Robert L.: *See*—
Aliberti, Vincent A.; Kruse, Robert L.; and Valcarce, Eduardo M., 4,417,030., Cl. 525-316.000.
Krysiak, Juergen: *See*—
Kueenzle, Paul; Krysiak, Juergen; and Reuter, Hans-Karl, 4,417,112., Cl. 200-146.00R.
Kubiatowicz, James F., to Custom Concepts, Incorporated. Moldable toy vehicle. 4,416,083., Cl. 46-208.000.
Kubo, Seitoku; Terakura, Yukio; Nakamura, Shinya; and Asami, Ken, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic transmission with electrical override. 4,417,307., Cl. 364-424.100.
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Easton, Richard L.; and Friedlund, Richard H., 4,416,367., Cl. 198-496.000.

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Magnin, Raymond, to Framatome. Nuclear power plant. 4,416,849., Cl. 376-296.000.
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Cunningham, Richard N.; and Loeffler, Romain E., deceased, 4,416,071., Cl. 34-155.000.
Markus, Henry Z.; and McAleer, William J., to Merck & Co., Inc. Methods of producing HBsAg. 4,416,986., Cl. 435-68.000.
Mars, Inc.: *See*—
Heiman, Frederic P., 4,416,365., Cl. 194-100.00A.
Marsh, Edward K.: *See*—
Frascatore, John F.; Nelson, Dean R.; and Marsh, Edward K., 4,416,499., Cl. 339-92.00M.
Marsh, Elizabeth A., executrix: *See*—
Marsh, William E., Jr. deceased; and Marsh, Elizabeth A., executrix, 4,416,463., Cl. 280-79.300.
Marsh, William E., Jr. deceased; and Marsh, Elizabeth A., executrix. Bulk storage cart. 4,416,463., Cl. 280-79.300.
Marshall, Robert, to Davy-Loewy Limited. Roll construction. 4,416,137., Cl. 72-243.000.
Marshall, Robert M.; Archie, William A.; and Dardoufas, Kimon C., to Allied Corporation. Soil resistant yarn finish for synthetic organic polymer yarn. 4,416,787., Cl. 252-8.800.
Martens, Jurgen: *See*—
Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, 4,416,827., Cl. 260-501.120.
Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, 4,416,828., Cl. 260-501.120.
Martin, Frank A., to Inland Steel Company. Electrotreating apparatus with depletable anode roll. 4,416,756., Cl. 204-206.000.
Martin, Henry, to Ciba-Geigy Corporation. 3,4-Dichlorophenylacetonitrile-N-tert.butylcarbamoyloxy ether for the protection of crops against injury by herbicides. 4,416,686., Cl. 71-105.000.
Martin, Van C.: *See*—
Fillmore, Gary L.; Martin, Van C.; and Ream, Gregory L., 4,417,256., Cl. 346-75.000.
Martini, Thomas; Frischkorn, Hans; Schinzel, Erich; and Probst, Heinz, to Hoechst Aktiengesellschaft. Mixtures of optical brighteners. 4,416,795., Cl. 252-301.230.
Martini, William R. Thermal regenerative machine. 4,416,114., Cl. 60-526.000.
Martorana, Piero: *See*—
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,416,893., Cl. 424-272.000.
Maruzen Sewing Machine Co., Ltd.: *See*—
Matsumura, Nobuyoshi, 4,416,206., Cl. 112-158.00B.
Maryland Cup Corporation: *See*—
Winstead, Thomas W., 4,416,607., Cl. 425-325.000.
Maryonovich, Michael; and Ebey, Edward, to Masco Corporation. Emergency stop mechanism. 4,416,366., Cl. 198-320.000.
Masaoka, Aritatsu: *See*—
Okamura, Yasuhumi; Masaoka, Aritatsu; and Kishita, Kazutaka, 4,417,040., Cl. 526-323.100.
Masco Corporation: *See*—
Maryonovich, Michael; and Ebey, Edward, 4,416,366., Cl. 198-320.000.
Massey-Ferguson Services N.V.: *See*—
McNaught, James B.; and Colotte, Guy E. P., 4,416,486., Cl. 296-190.000.
Massey, Michael L.: *See*—
Hager, Donald G.; Massey, Michael L.; and Rubel, Frederick, Jr., 4,416,798., Cl. 502-420.000.
Masuda, Youichi: *See*—
Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,417,153., Cl. 307-140.000.
Masukawa, Toyoaki: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,416,980., Cl. 430-567.000.
Matalis, John A.; Heinie, Richard L.; and Wegerer, Duane E., to International Harvester Co. Plow bolt. 4,416,573., Cl. 411-378.000.
Material Sciences Corporation: *See*—
Graziano, Frank D.; and Kuziemka, Edmund J., 4,417,006., Cl. 523-435.000.
Mathews, Bruce D., to Westinghouse Electric Corp. Adaptive collision threat assessor. 4,417,248., Cl. 343-16.00M.
Matsuda, Shigeo: *See*—
Sugiyama, Kazuo, 4,417,217., Cl. 331-66.000.
Matsuda, Tsutomu; Hirabayashi, Takeo; Yanagihara, Takeshi; and Sakurai, Shinjiro, to Ricoh Co., Ltd. Diazo copying element. 4,416,967., Cl. 430-159.000.
Matsuhisa, Koh: *See*—
Iwata, Nobuo; Matsuhisa, Koh; Takada, Hiromi; and Suzuki, Takami, 4,416,556., Cl. 400-144.200.
Matsumoto, Yosuke: *See*—
Kinase, Takashi; Ichimura, Seiji; Kinjo, Yoshio; and Matsumoto, Yosuke, 4,416,742., Cl. 204-47.000.

Matsumura, Nobuyoshi, to Maruzen Sewing Machine Co., Ltd. Control for automatic buttonhole apparatus in zigzag sewing machine. 4,416,206., Cl. 112-158.00B.

Matsumura, Shunichi: *See—*
Inata, Hiroo; and Matsumura, Shunichi, 4,416,839., Cl. 264-49.000.

Matsuo, Masanori: *See—*
Tomioka, Shunzo; Okano, Kinpei; Matsuo, Masanori; Hasegawa, Akira; and Kitamura, Akira, 4,416,555., Cl. 384-415.000.

Matsuo, Masataka: *See—*
Hiromi, Fukuoka; Matsuo, Masataka; Hamai, Kazuo; Hatta, Tokuaki; and Sugawara, Mituo, 4,416,999., Cl. 501-94.000.

Matsuo, Syunji: *See—*
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kaneko, Yutaka; and Kawasaki, Mikio, 4,416,980., Cl. 430-567.000.

Matsuo, Taisuke; and Ochiai, Michihiko, to Takeda Chemical Industries, Ltd. 3-Methoxy-2-oxoazetidine derivatives and their production. 4,416,817., Cl. 260-239.00A.

Matsuo, Takaharu; Sawamura, Norio; Hashimoto, Yukio; and Hashida, Wataru, to Fuji Oil Company, Limited. Method for enzymatic transesterification of lipid and enzyme used therein. 4,416,991., Cl. 435-134.000.

Matsuoka, Hiroki, to Toyota Jidosha Kabushiki Kaisha. Device and method for controlling fuel injected internal combustion engine providing hot deceleration enrichment. 4,416,240., Cl. 123-493.000.

Matsushita Electric Industrial Company, Limited: *See—*
Horiuchi, Naoya; Ohhara, Takafumi; and Sano, Reiji, 4,417,340., Cl. 372-58.000.
Inoue, Michihiro; Takemoto, Toyoki; and Yamada, Haruyasu, 4,417,233., Cl. 340-347.0AD.
Nakase, Yoshimori; and Sagishima, Takayuki, 4,417,271., Cl. 358-24.000.
Shimizu, Hideharu; and Hashimoto, Akihiko, 4,416,616., Cl. 431-325.000.
Takesako, Yoshinobu; Watanabe, Masanori; and Nonomura, Kinzo, 4,417,184., Cl. 315-366.000.
Uya, Masaru, 4,417,161., Cl. 307-471.000.

Matsushita Electric Works, Ltd.: *See—*
Touhou, Makoto; Wada, Shigeaki; and Yamamoto, Minoru, 4,417,172., Cl. 313-156.000.

Matsuura, Masataka: *See—*
Funada, Fumiaki; Matsuura, Masataka; and Wada, Tomio, 4,416,515., Cl. 350-350.00F.

Matsuura, Shigeo: *See—*
Shinkawa, Keiro; Matsuura, Shigeo; Sodeyama, Chuichi; Noda, Masaki; and Kondo, Masakazu, 4,417,279., Cl. 358-195.100.

Matsuura, Yoshiaki, to Kabushiki Kaisha Daini Seikosha. Semiconductor device. 4,417,263., Cl. 357-23.000.

Mattel, Inc.: *See—*
Guerrero, Benjamin G.; and Berford, Saint Elmo B., 4,416,074., Cl. 40-364.000.

Matthew, James Elton: *See—*
Matthew, Lee M., 4,416,402., Cl. 224-42.240.

Matthew, Lee M., to Matthew, James Elton. Spare tire mount for pickup truck. 4,416,402., Cl. 224-42.240.

Mattox, Robert G. Spring assist drive for cycle. 4,416,464., Cl. 280-215.000.

Maugweiler, Gottfried: *See—*
Haggenmacher, Thomas; Gut, Edwin; Friedli, Hans; and Maugweiler, Gottfried, 4,416,489., Cl. 299-94.000.

Maurer, Roland: *See—*
Wolber, Robert; and Maurer, Roland, 4,416,550., Cl. 368-88.000.

Mayer, Edward F., to Ricoh Company, Ltd. Electrophotographic copying apparatus and subsystems therefor. 4,416,531., Cl. 355-3.0TR.

Mayfield, Glenn A., to Duncan Electric Company, Inc. Average responding RMS indicating type transducer. 4,417,198., Cl. 323-315.000.

Maytag Company, The: *See—*
Jordan, Lawrence J., 4,416,300., Cl. 134-108.000.

McAleer, William J.: *See—*
Markus, Henry Z.; and McAleer, William J., 4,416,986., Cl. 435-68.000.

McAulay, John M. S.: *See—*
Frahm, Carl E.; Larson, Erick L.; and McAulay, John M. S., 4,416,383., Cl. 215-256.000.

McCaffrey, David J. A.; and Jones, William D., deceased (by Jones, Barbara, legal representative), to Coal Industry (Patents) Limited. Froth flotation. 4,416,769., Cl. 209-166.000.

McCarthy, Barry, to Quinn Engineers Ltd. Union nut. 4,416,575., Cl. 411-432.000.

McCarthy, Jeremiah P.; and Tabasky, Marvin, to GTE Laboratories Incorporated. Method of fabricating a monolithic integrated circuit structure. 4,416,055., Cl. 29-577.00C.

McCarty, Patrick R.: *See—*
Gingerich, David J.; McCarty, Patrick R.; and Shaffer, David T., 4,417,106., Cl. 200-5.00R.

McCormick Laboratories, Inc.: *See—*
Bresler, Robert G., 4,416,289., Cl. 128-737.000.

McCorsley, Clarence C., III, to Akzona Incorporated. Shaped cellulose article prepared from a solution containing cellulose dissolved in a tertiary amine N-oxide solvent and a process for making the article. 4,416,698., Cl. 106-163.00R.

McCutchen, Hugh, Jr.: *See—*
Tanner, Curtis J.; Bender, Richard E.; Simson, Anton K.; and McCutchen, Hugh, Jr., 4,416,329., Cl. 166-68.000.

McDonald, Robert C.: *See—*
Goebel, Franz; and McDonald, Robert C., 4,416,957., Cl. 429-91.000.

McDonald, Ross W., to Cummins Engine Company, Inc. Control system for a dual fuel internal combustion engine. 4,416,244., Cl. 123-577.000.

McDonnell Douglas Corporation: *See—*
McKinney, Howard F.; and Wear, Frederick C., 4,416,908., Cl. 426-241.000.

McElroy, David J., to Texas Instruments Incorporated. Semiconductor integrated circuit with vertical implanted polycrystalline silicon resistor. 4,416,049., Cl. 29-571.000.

McGinnis, Ralph E.; and Gray, Lewis, to Westinghouse Electric Corp. Grooved honeycomb labyrinth seal for steam turbines. 4,416,457., Cl. 277-53.000.

McGovern, Terrence P.; and Schreck, Carl E., to United States of America, Agriculture. Insect repellents employing cyclohexane-carbonyl morpholine compounds. 4,416,881., Cl. 424-248.540.

McInerny, George P., to Technitrol, Inc. Document separating apparatus and method. 4,416,449., Cl. 271-122.000.

McInroy, John W.; Waldo, Paul D.; and Webster, Harold R., to International Business Machines Corporation. Method of controlling a printer in an interactive text processing system to print records from stored files of spatially related data. 4,416,558., Cl. 400-279.000.

McKee, Terrence J., to Lumonics Inc. Laser. 4,417,342., Cl. 372-87.000.

McKenna, Joseph V., to Singer Company, The. Multiplexed analog to digital converter having a feedback stabilized ramp. 4,417,234., Cl. 340-347.0AD.

McKeown, John B., to McLeod & Miller (Engineers) Limited. Apparatus with semi-permeable membrane, and method for cultivating micro-organisms. 4,416,993., Cl. 435-243.000.

McKinney, Howard F.; and Wear, Frederick C., to McDonnell Douglas Corporation. Insect de-infestation method. 4,416,908., Cl. 426-241.000.

McLeod & Miller (Engineers) Limited: *See—*
McKeown, John B., 4,416,993., Cl. 435-243.000.

McMahon, Matthew A.; Wilson, Raymond F.; Eng, King D.; and Burns, Robert B., to Texaco Inc. Filter for treating a particle-carrying gaseous stream. 4,416,674., Cl. 55-485.000.

McMahon, Paul E.: *See—*
Peterson, Howell L.; and McMahon, Paul E., 4,416,924., Cl. 427-388.100.

McNaught, James B.; and Colotte, Guy E. P., to Massey-Ferguson Services N.V. Vehicle cab. 4,416,486., Cl. 296-190.000.

Mead Corporation, The: *See—*
Sanders, Frederick W.; Wright, Richard F.; and Adair, Paul C., 4,416,966., Cl. 430-138.000.

Mead Johnson & Company: *See—*
Balser, Donald R., 4,417,049., Cl. 544-231.000.

Medford, William K.: *See—*
Turpin, Raymond L.; and Medford, William K., 4,416,294., Cl. 130-30.00R.

Medi-Dose, Inc.: *See—*
Braverman, Milton; and Zink, Leonard, 4,416,375., Cl. 206-534.100.

Medinger, Walter. Apparatus for automatically feeding screws to a screwing mechanism. 4,416,172., Cl. 81-57.370.

Medtronic, Inc.: *See—*
Bennett, Matthew C.; and Strange, Donald R., 4,417,276., Cl. 358-160.000.
Citron, Paul; Hepp, Dennis G.; and Jirak, Thomas L., 4,417,306., Cl. 364-415.000.

Medwin, Herman. Method for optimizing the design of a finite noise barrier. 4,417,313., Cl. 364-524.000.

Mehta, Avinash C., to Polaroid Corporation. Biphenyl compounds and method of preparing same. 4,417,064., Cl. 549-415.000.

Meidensha Electric Mfg. Co., Ltd.: *See—*
Hashimoto, Takafumi; and Kobari, Yukio, 4,416,953., Cl. 429-18.000.

Meier, Jacques, to Ferag AG. Method and apparatus for the insertion of at least one insert or supplement into printed products. 4,416,448., Cl. 270-55.000.

Melas, Constantin M., to International Business Machines Corp. Automatic path rearrangement for blocking switching matrix. 4,417,244., Cl. 340-825.800.

Melas, Constantin M.; and Patten, Michael A., to International Business Machines Corp. Digital space division exchange. 4,417,245., Cl. 340-825.800.

Menbaev, Zaurbek K.: *See—*
Anisovich, Kliment V.; Komyak, Nikolai I.; and Menbaev, Zaurbek K., 4,417,355., Cl. 378-49.000.

Menke, Russell O.; and Bortnik, Michael, to UOP Inc. Scale-inhibiting compositions of matter. 4,416,785., Cl. 210-699.000.

Menth, Anton; and Stucki, Samuel, to BBC Brown, Boveri & Company Limited. Process for the synthetic production of ozone by electrolysis and use thereof. 4,416,747., Cl. 204-129.000.

Merchant, Philip, Jr.; and Smith, Dean L., Jr., to Exxon Research and Engineering Co. Compositions and process for dedusting solids-containing hydrocarbon oils. 4,416,754., Cl. 204-190.000.

Mercier, Olivier: *See—*
Albrecht, Joachim; Duerig, Thomas; Mercier, Olivier; and Weber, Walter, 4,416,706., Cl. 148-11.50C.

Merck & Co., Inc.: *See—*
Hartman, George D., 4,416,882., Cl. 424-250.000.
Markus, Henry Z.; and McAleer, William J., 4,416,986., Cl. 435-68.000.
Smith, Graham M., 4,416,635., Cl. 434-280.000.

Woltersdorf, Otto W., Jr., 4,416,890., Cl. 424-270.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Fischer, Wolfgang; and Krenn, Karl-Dieter, 4,416,997., Cl. 436-42.000.
Merkler, Anton: *See*—
Hesse, Heinrich; Merkler, Anton; Gross, Siegfried; and Radtke, Gerhard, 4,416,139., Cl. 72-267.000.
Merlin Gerin: *See*—
Bancalari, Jean, 4,417,223., Cl. 335-195.000.
Merola, Carl R.: *See*—
Vaill, Ronald E.; Ciccotelli, Stephen S.; and Merola, Carl R., 4,417,108., Cl. 200-50.0AA.
Merritt, David T.; Fish, David W.; and Long, Olen R., to Otis Engineering Corporation. Side pocket mandrel. 4,416,330., Cl. 166-117.500.
Mertin, Dietrich: *See*—
Derner, Paul; and Mertin, Dietrich, 4,416,101., Cl. 52-398.000.
Merz, Johann, to Zahnradfabrik Friedrichshafen, AG. Rotary vane pump with pressure biased flow directing end plate. 4,416,598., Cl. 418-132.000.
Mes, Johannes A. M., to U.S. Philips Corporation. Stop motion system for playing back a program recorded on a disc-shaped record carrier. 4,417,285., Cl. 358-342.000.
Mesnel, Francois, to Etablissements Mesnel. Extruded sealing strip with fabric covered gripping means, particularly for application to automotive vehicles. 4,416,951., Cl. 428-586.000.
Mesquida-Feirman, B.: *See*—
Desmond, John D.; and Mesquida-Feirman, B., 4,416,411., Cl. 229-40.000.
Metallgesellschaft AG: *See*—
Lohrberg, Karl; Pfohl, Rainer; and Gritschke, Martin, 4,416,744., Cl. 204-95.000.
von Jordan, Wenzel; and Neulinger, Franz, 4,416,671., Cl. 55-4.000.
Metra, Piero: *See*—
Occhini, Elio; Lanfranconi, Gianmario; and Metra, Piero, 4,417,093., Cl. 174-25.00R.
Metro-Tel Corp.: *See*—
Carlson, Alan J.; and Indelicato, Venerando J., 4,417,100., Cl. 179-5.00R.
Metzger, Bruce A., to Dow Chemical Co., The. Polymer blends and laminates and adhesive films prepared therefrom. 4,416,937., Cl. 428-286.000.
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, to Bayer Aktiengesellschaft. Antibiotic compound, its production and its medicinal use. 4,416,870., Cl. 424-172.000.
Metzger, Karl G.: *See*—
Boberg, Michael; and Metzger, Karl G., 4,416,880., Cl. 424-246.000.
Meuser, Friedrich: *See*—
Huster, Heinrich; Meuser, Friedrich; and Hoepke, Carl-Heinz, 4,416,701., Cl. 127-68.000.
Meyer-Ebrecht, Dietrich: *See*—
Groh, Gunther; Weiss, Hermann; Wagner, Wolfgang; Pasedach, Klaus; Kowalski, Gunter; and Meyer-Ebrecht, Dietrich, 4,417,353., Cl. 378-4.000.
Meyers, William E., to Carson Products Company. Composition and method for hair treatment. 4,416,296., Cl. 132-7.000.
Meyr, Heinrich: *See*—
Bapst, Urs; Keller, Heinz; Meyr, Heinrich; and Muller, Hans R., 4,417,242., Cl. 340-825.050.
Mezawa, Tutomu; Kabashima, Katsuhiko; Nozaki, Shigeki; and Takemae, Yoshihiro, to Fujitsu Limited. Active pull-up circuit. 4,417,329., Cl. 365-203.000.
Michel, Dominique: *See*—
Lamy, Jacques E.; Michel, Dominique; and Serrano, Francisco D. M., 4,416,473., Cl. 285-41.000.
Mietzsch, Fritz: *See*—
Muisers, Hans-Ferdinand; Arlt, Dieter; Jautelat, Manfred; Alberts, Heinrich; and Mietzsch, Fritz, 4,417,037., Cl. 526-271.000.
Miike, Akira: *See*—
Tsuda, Mitsuru; Miike, Akira; Shimizu, Yoshiaki; Yokote, Yasuharu; and Tatano, Toshio, 4,416,982., Cl. 435-11.000.
Miki Corporation: *See*—
Tabata, Hiromaro, 4,416,612., Cl. 431-131.000.
Miklos, Richard L.; and Lamphere, Craig F., to Minnesota Mining and Manufacturing Company. Recording diskette having flocked-fiber wiping fabric. 4,417,291., Cl. 360-133.000.
Mikolajczyk, Raymond F. Portable proportioning device. 4,416,547., Cl. 366-150.000.
Mikumo, Masatoshi: *See*—
Toba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, 4,417,025., Cl. 525-54.210.
Milan, Drndarski. Universal reflector of electromagnetic waves mounted on a float. 4,416,509., Cl. 350-102.000.
Milas, Michel: *See*—
Rinaudo, Marguerite; Milas, Michel; and Kohler, Norbert, 4,416,990., Cl. 435-104.000.
Miles, Melvin H.; and Fletcher, Aaron N., to United States of America, Navy. Thermal battery cells utilizing $AgNO_3$ in $LiClO_4$-$LiNO_3$ mixtures. 4,416,958., Cl. 429-103.000.
Milkovich, Ralph, to Atlantic Richfield Company. Derivatization of star-block copolymers. 4,417,029., Cl. 525-314.000.
Miller, Donald L., to Facet Enterprises, Incorporated. Electromagnetic cone clutch with ball torque booster. 4,416,359., Cl. 192-54.000.
Miller, Gregory E. Static diverter module. 4,416,378., Cl. 209-583.000.
Miller, Joseph E. Bone plug cutter. 4,416,278., Cl. 128-305.000.
Miller, Judith A. Artery or vein perforator. 4,416,039., Cl. 27-21.000.
Miller, Robert F.; and Davis, Paul K. Pipe coupling. 4,416,474., Cl. 285-47.000.
Miller, Stephen J., to Chevron Research Company. Efficient fluidized oligomerization. 4,417,086., Cl. 585-530.000.
Miller, Stephen J., to Chevron Research Company. Fluidized oligomerization. 4,417,087., Cl. 585-530.000.
Miller, Stephen J., to Chevron Research Company. Oligomerization of liquid olefins. 4,417,088., Cl. 585-533.000.
Miller, Timothy J. E.; and Jones, Donald W., to General Electric Company. Permanent magnet rotor for a dynamo electric machine. 4,417,168., Cl. 310-156.000.
Miller, William T., to Cherokee Products Company. Pimento coring machine. 4,416,195., Cl. 99-544.000.
Mills, David: *See*—
Goddard, John; and Mills, David, 4,416,321., Cl. 164-80.000.
Mills, Thomas L.: *See*—
Cline, Charles D.; and Mills, Thomas L., 4,417,016., Cl. 524-156.000.
Mima, Hiroshi, to Murata Kikai Kabushiki Kaisha. Splicing apparatus for spun yarns. 4,416,110., Cl. 57-22.000.
Minagawa, Motonobu; Inoue, Tetsuyu; and Kurita, Naoyasu, to Adeka Argus Chemical Co., Ltd. Chlorinated organic compounds having their resistance to deterioration enhanced by 1,3-dicarbonyl compounds. 4,416,797., Cl. 252-400.00A.
Minasov, Alexandr N.: *See*—
Likhogub, Evgeny P.; Sergeev, Stanislav S.; and Minasov, Alexandr N., 4,416,733., Cl. 202-228.000.
Minnesota Mining and Manufacturing Company: *See*—
Carpenter, Walter L.; and Amrine, Bruce A., 4,416,280., Cl. 128-399.000.
Dressler, Daryl D., 4,417,247., Cl. 340-825.310.
Miklos, Richard L.; and Lamphere, Craig F., 4,417,291., Cl. 360-133.000.
Smith, Daniel D., 4,416,392., Cl. 221-45.000.
Minolta Camera Kabushiki Kaisha: *See*—
Ito, Hideo; Ito, Masazumi; Nagata, Kenzo; and Irie, Yutaka, 4,417,350., Cl. 377-8.000.
Tottori, Takafumi, 4,416,535., Cl. 355-14.00D.
Uesugi, Kyozo, 4,416,513., Cl. 350-255.000.
Mita Industrial Co., Ltd.: *See*—
Miyakawa, Nobubiro; Teshima, Takashi; Koyama, Haruo; Makawa, Kouji; and Fujii, Masanori, 4,416,964., Cl. 430-106.600.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Banba, Toshio; Mizuno, Masanori; and Mizuno, Takaii, 4,417,130., Cl. 219-130.510.
Okuda, Takio; and Sakai, Junichi, 4,417,119., Cl. 219-72.000.
Sugimoto, Hiroshi, 4,416,160., Cl. 73-862.170.
Wada, Hifumi; and Nanba, Mitsuaki, 4,417,267., Cl. 357-81.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Sugano, Junichiro; Kobayashi, Shuichi; Yui, Tomoyuki; Fujimoto, Tsuneo; and Kubota, Minoru, 4,416,606., Cl. 425-202.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Morikawa, Masaki; Yoshida, Hideaki; Kishida, Kunio; and Tanaka, Chuji, 4,416,853., Cl. 420-469.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Ohashi, Minoru; Futaki, Kiyoshi; and Iwaosa, Katsuaki, 4,416,977., Cl. 430-446.000.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Enomoto, Shogo; Sawai, Masanobu; Seo, Iwao; and Yamaguchi, Tomonobu, 4,416,269., Cl. 128-41.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Ohkawa, Koue; Fujii, Shin; and Seino, Takashi, 4,417,011., Cl. 523-527.000.
Mitsui, Yoshihiro, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Printing head for thermal printer. 4,417,257., Cl. 346-76.0PH.
Mitsumi Electric Company, Ltd.: *See*—
Shimazu, Teruo, 4,416,164., Cl. 74-10.330.
Mitsuyasu, Masaki: *See*—
Aoki, Keiji; and Mitsuyasu, Masaki, 4,416,237., Cl. 123-438.000.
Miura, Tadao: *See*—
Takaoka, Takashi; Mochizuki, Masahiko; Yamashita, Mitsuo; and Miura, Tadao, 4,417,331., Cl. 369-111.000.
Miyakawa, Nobuhiro; Teshima, Takashi; Koyama, Haruo; Mackawa, Kouji; and Fujii, Masanori, to Mita Industrial Co., Ltd. Dry magnetic developer containing a non-pulverizing agglumerate of cubic magnetite particles. 4,416,964., Cl. 430-106.600.
Miyamoto, Tomohisa: *See*—
Fujii, Setsuro; Yasui, Bompei; Nakamura, Mitsuo; Miyamoto, Tomohisa; Ando, Kazuko; Hashimoto, Iwao; Sawai, Yoneichi; Umeda, Naoki; and Kawasaki, Masahiro, 4,416,875., Cl. 424-180.000.
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Mo och Domsjo Aktiebolag: *See*—
Lofgren, Stig-Gunnar; and Ekeborg, Bo G., 4,416,335., Cl. 172-2.000.
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Chester, Arthur W.; Cormier, William E., Jr.; and Stover, William A., 4,416,765., Cl. 208-120.000.
Chu, Chin-Chiun, 4,417,084., Cl. 585-440.000.
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Perucchi, Norberto; and Mock, Elmar, 4,417,166., Cl. 310-49.00R.
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Kessler, John R., 4,416,201., Cl. 101-348.000.
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D'Amico, John J.; and Schafer, Tann R., 4,416,687., Cl. 71-109.000.
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Moody, Albert L., to F. C. Brown Rentals, Inc. Asphalt heating kettle apparatus. 4,416,614., Cl. 431-278.000.
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Ichikawa, Takashi; and Moriyama, Sadao, 4,416,716., Cl. 156-245.000.
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Morris, Lionel G. Drive mechanisms. 4,416,460., Cl. 280-3.000.
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Dorler, Jack A.; Mosley, Joseph M.; Seeger, Richard O.; and Weitzel, Stephen D., 4,417,159., Cl. 307-270.000.
Motion Control, Inc.: *See*—
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Davis, William F., 4,417,216., Cl. 330-294.000.
Ingle, William M.; Darnell, Robert D.; and Thompson, Stephen W., 4,416,913., Cl. 427-45.100.
Kuo, Clinton C. K., 4,417,154., Cl. 307-202.100.
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Huther, Werner, 4,416,621., Cl. 431-352.000.
Mueller, Peter F.; and Caulfield, H. John, to Aerodyne Research, Inc. Image enhancement. 4,416,538., Cl. 355-67.000.
Muisers, Hans-Ferdinand; Arlt, Dieter; Jautelat, Manfred; Alberts, Heinrich; and Mietzsch, Fritz, to Bayer Aktiengesellschaft. Vinyl acylanhydrocitrates and their preparation. 4,417,037., Cl. 526-271.000.
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Mulaskey, Bernard F., to Chevron Research Company. Hydrocarbon conversion with crystalline silicates. 4,416,766., Cl. 208-135.000.
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Muller, Jean-Claude H.: *See*—
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Demke, Kent R.; and Mumola, Joanne L., 4,417,239., Cl. 340-709.000.
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Munson, Leo J.; Griauzde, Felix; Okada, David T.; and Loomis, Bernard, to CPG Products Corp. Interlocking word game utilizing prismatic blocks and method of playing same. 4,416,455., Cl. 273-272.000.

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Burns, Edward P., 4,416,369., Cl. 206-45.290.
Nachev, Georgi N.; Angelov, Angel S.; and Petkov, Boryan I., to Institute Po Technicheska Kibernetika I Robotika. Method and apparatus for seam tracking in arc welding. 4,417,127., Cl. 219-124.340.
Naganawa, Hiroshi: *See*—
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Nagao, Nobuya; and Inoue, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Wide band chrominance demodulator with color noise reduction function. 4,417,270., Cl. 358-23.000.
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Nakagawa, Toshiaki, to Yoshida Kogyo K. K. Slide fastener finishing machine. 4,416,060., Cl. 29-767.000.
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Nakata, Koreaki; Todoroki, Tsunehiko; Oita, Masahiro; and Oshima, Nobumasa. Chip type tantalum capacitor. 4,417,298., Cl. 361-433.000.
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Nakatsukasa, Walter M.; Fayerman, Jeffrey T.; and Mabe, James A., to Eli Lilly and Company. Plasmid pEL7 and related cloning vectors for use in streptomyces and related organisms. 4,416,994., Cl. 435-253.000.
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Rushby, Robert J.; and Damms, Anthony B., 4,417,136., Cl. 235-379.000.
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Neckers, Douglas C. Peresters and use thereof. 4,416,826., Cl. 260-453.0RZ.
Neefe, Charles W. Spin casting of contact lenses. 4,416,837., Cl. 264-2.100.
Nelkin, Nedwyn R., to H. G. Enterprises. Combination underpant and hernial truss. 4,416,272., Cl. 128-96.000.
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Nelson, James W.; Zuzinec, Raymond R.; and Foster, Michael L., to Snap-on Tools Corporation. Control mechanism for a pneumatic tool. 4,416,338., Cl. 173-134.000.
Nelson, Robert T. Cleaning apparatus. 4,416,092., Cl. 51-425.000.
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Thorne, J. Paul, 4,417,122., Cl. 219-108.000.

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Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Tanaka, Kazutoshi, 4,417,228., Cl. 338-34.000.

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Nakamura, Kazuo; Mizorogi, Hirotsugu; and Isao, Akihiko, 4,416,216., Cl. 118-696.000.
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Nikko Co., Ltd.: *See*—
Yamamoto, Seiji, 4,417,343., Cl. 373-73.000.

Nilsson, Claes T.; Jakobsen, Kjell M.; and Larson, Las G., to PLM AB. Tubular article of polyethylene terephthalate having a wall of amorphous material with a peripheral groove therein of monoaxially oriented material. 4,416,927., Cl. 428-36.000.

Nilsson, Hans E.; and Carlsson, Ake, to Infrarodteknik AB. Apparatus for surface treatment of objects. 4,416,068., Cl. 34-4.000.

Nimry, Tayseer S.; and Fields, Ellis K., to Standard Oil Company (Indiana). Polyimides and polyimide-amides. 4,417,045., Cl. 528-188.000.

Nippert Company, The: *See*—
Nippert, Russell A., 4,416,141., Cl. 72-345.000.

Nippert, Russell A., to Nippert Company, The. Method and apparatus for forming an electrical connector. 4,416,141., Cl. 72-345.000.

Nippon Asbestos Company, Limited: *See*—
Aoki, Susumu; Asaumi, Hiroshi; Take, Shigeo; and Akase, Masazumi, 4,416,043., Cl. 29-132.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Wachi, Masatada, 4,416,179., Cl. 84-1.190.

Nippon Genshiryoku Jigyo Kabushiki Kaisha: *See*—
Kodama, Tasuku; and Taruishi, Yoshiaki, 4,416,850., Cl. 376-310.000.

Nippon Kogaku K.K.: *See*—
Kusaka, Yosuke, 4,417,139., Cl. 250-204.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Haga, Yukio; Kai, Tomeo; Shirayama, Akira; and Kanatani, Gengi, 4,416,580., Cl. 414-626.000.
Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, 4,417,128., Cl. 219-125.120.

Nippon Metal Plating Co., Ltd.: *See*—
Kinase, Takashi; Ichimura, Seiji; Kinjo, Yoshio; and Matsumoto, Yosuke, 4,416,742., Cl. 204-47.000.

Nippon Mining Co., Ltd.: *See*—
Kinase, Takashi; Ichimura, Seiji; Kinjo, Yoshio; and Matsumoto, Yosuke, 4,416,742., Cl. 204-47.000.

Nippon Soken, Inc.: *See*—
Kago, Yoshiyuki; and Akita, Sigeyuki, 4,416,150., Cl. 73-119.00A.
Nishida, Minoru; Hattori, Tadashi; Mukainakano, Shinichi; Mizuno, Toru; and Goto, Tukasa, 4,416,226., Cl. 123-143.00B.

Nippon Steel Corporation: *See*—
Hiromi, Fukuoka; Matsuo, Masataka; Hamai, Kazuo; Hatta, Tokuaki; and Sugawara, Mituo, 4,416,999., Cl. 501-94.000.
Hiroshima, Soichi; Hirasawa, Hidenao; Nakasai, Yoshinori; and Takayama, Keiichi, 4,416,442., Cl. 266-44.000.

Nippon Telegraph and Telephone Public Corporation: *See*—
Otsuki, Yoshio; Uesugi, Masaru; and Ieda, Nobuaki, 4,417,163., Cl. 307-475.000.

Nippondenso Co., Ltd.: *See*—
Naito, Mitikatu; Yano, Kiyotosi; and Itou, Kazuo, 4,416,243., Cl. 123-569.000.
Nishida, Minoru; Hattori, Tadashi; Mukainakano, Shinichi; Mizuno, Toru; and Goto, Tukasa, 4,416,226., Cl. 123-143.00B.
Shiozaki, Makoto; Haseda, Satoshi; Tarui, Jun; Ito, Osamu; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Kawai, Shizuo; and Sami, Hiroshi, 4,416,232., Cl. 123-357.000.
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,416,235., Cl. 123-425.000.

Nishida, Hideki: *See*—
Asano, Atsushi; Takeshita, Masatoshi; Nishida, Hideki; Suzuki, Ryo; and Futami, Toshio, 4,417,323., Cl. 365-1.000.

Nishida, Minoru; Hattori, Tadashi; Mukainakano, Shinichi; Mizuno, Toru; and Goto, Tukasa, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Laser ignition apparatus for an internal combustion engine. 4,416,226., Cl. 123-143.00B.

Nishimura, Shigeyuki: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Nishimura, Shigeyuki, 4,417,055., Cl. 546-345.000.

Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Nishimura, Shigeyuki, to Ishihara Sangyo Kaisha Ltd. Process for producing a β-trifluoromethylpyridine. 4,417,055., Cl. 546-345.000.

Nishizawa, Jun-ichi; and Shiota, Ikuo, to Zaidan Hojin Handotai Kenkyu Shinkokai. Oxynitride film and its manufacturing method. 4,416,952., Cl. 428-698.000.

Nissan Chemical Industries, Ltd.: *See*—
Arai, Kazutaka; Ohara, Yoshio; Takakuwa, Yasuo; and Iizumi, Toyoko, 4,417,070., Cl. 560-56.000.

Nissan Motor Co., Ltd.: *See*—
Fujishiro, Takeshi, 4,416,763., Cl. 204-412.000.
Hayashi, Toshio; and Hayashi, Isao, 4,416,461., Cl. 280-5.00A.
Hayashi, Yoshimasa, 4,416,350., Cl. 181-272.000.
Ikeura, Kenji, 4,416,234., Cl. 123-424.000.
Izumi, Masao; and Yoshida, Hiroshi, 4,416,192., Cl. 98-40.00N.
Katayose, Shinji; Ohwada, Masatsugu; and Oka, Takashi, 4,416,230., Cl. 123-325.000.
Kitamura, Hidetoshi; and Kato, Hirohisa, 4,416,149., Cl. 73-118.000.
Murakami, Masamitsu, 4,416,446., Cl. 267-140.300.
Takase, Sadao; and Hosaka, Akio, 4,416,239., Cl. 123-478.000.

Nissin Kogyo Kabushiki Kaisha: *See*—
Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, 4,416,191., Cl. 92-165.0PR.

Nitta, Toshimi: *See*—
Takeda, Minoru; Nitta, Toshimi; and Saito, Hitoshi, 4,416,390., Cl. 220-273.000.

Nitz, Rolf-Eberhard: *See*—
Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, 4,416,893., Cl. 424-272.000.

Nizova, Svetlana A.: *See*—
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,417,076., Cl. 568-361.000.

Noakes, John E. Disposal of radioactive aromatic liquid wastes. 4,416,810., Cl. 252-628.000.

Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel. 4,416,428., Cl. 242-84.21R.

Noda, Masaki: *See*—
Shinkawa, Keiro; Matsuura, Shigeo; Sodeyama, Chuichi; Noda, Masaki; and Kondo, Masakazu, 4,417,279., Cl. 358-195.100.

Noguchi, Kohji; and Kasai, Masao, to Asahi Kasei Kogyo Kabushiki Kaisha. Liquid chromatography column, process for preparing the same and its use for fractionation. 4,416,783., Cl. 210-635.000.

Noguchi, Masaru: *See*—
Takeuchi, Hideaki; Takahashi, Tsunehiko; and Noguchi, Masaru, 4,417,149., Cl. 250-563.000.

Nola, Frank J., to United States of America, National Aeronautics and Space Administration. Control system for an induction motor with energy recovery. 4,417,190., Cl. 318-729.000.

Noll, Istvan: *See*—
Szebenyi, Ferenc; Nemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, 4,416,566., Cl. 405-291.000.

Nolte, Wilfried; and Esser, Heinz, to Bayer Aktiengesellschaft. Process for the polymerization of chloroprene. 4,417,036., Cl. 526-211.000.

Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, to Nippon Kokan Kabushiki Kaisha. Arc welding method utilizing reciprocal movement of a torch in width direction of groove to be welded, and continuous movement of torch in longitudinal direction of groove to be welded. 4,417,128., Cl. 219-125.120.

Nonomura, Kinzo: *See*—
Takesako, Yoshinobu; Watanabe, Masanori; and Nonomura, Kinzo, 4,417,184., Cl. 315-366.000.

Noral, Inc.: *See*—
Huebscher, David A., 4,416,553., Cl. 374-165.000.

Nordin, Inge, to Olofsson, Roland. Ladder tape roll for venetian blinds. 4,416,320., Cl. 160-177.000.

Nordson Corporation: *See*—
Sharpless, John, 4,416,193., Cl. 98-115.0SB.

Norioka, Setsuo, to JOEL Ltd. Apparatus for controlling magnetic field intensity. 4,417,145., Cl. 250-396.0ML.

Norman, Melvin H.; Manske, Reinhold R.; and Sheehan, Neil J., to Cutter Laboratories, Inc. Injection site for fluids. 4,416,661., Cl. 604-86.000.

Norquest, Peter E. Ambient pressure water turbine. 4,416,584., Cl. 415-184.000.

Northern Telecom Limited: *See—*
Beun, Roger A., 4,417,095., Cl. 174-52.0FP.

Northrop Corporation: *See—*
Bettner, Timothy J.; Sullivan, Frank E.; and Hartley, Croydon R., 4,416,175., Cl. 83-29.000.

Northwest Orthodontics, Inc.: *See—*
Armstrong, Maclay M., 4,416,625., Cl. 433-5.000.

Norwood Marking & Equipment Co., Inc.: *See—*
Davison, Charles F., 4,416,199., Cl. 101-193.000.

Nosseir, Sami S., to Quebec Cartier Mining Company. Ore beneficiation. 4,416,768., Cl. 209-3.000.

Novey, Richard T., to Alpha Poultry & Livestock Equip., Inc. Nipple waterer and valve. 4,416,221., Cl. 119-72.500.

Nozaki, Shigeki: *See—*
Mezawa, Tsutomu; Kabashima, Katsuhiko; Nozaki, Shigeki; and Takemae, Yoshihiro, 4,417,329., Cl. 365-203.000.

Nufer, Karl, to Fritz Gegauf Ag Bernina-Naehmaschinenfabrik. Auxiliary device for a sewing machine. 4,416,208., Cl. 112-240.000.

Numazawa, Masaaki; Tashiro, Hidetaka; and Ishii, Shuichi, to Senko Medical Instrument Mfg. Co. Blood suction device. 4,416,658., Cl. 604-48.000.

Nyberg, Johan E. Thermally producing a high-speed atomized liquid jet. 4,416,117., Cl. 60-650.000.

Nylund, Olov, to AB Asea-Atom. Multi-elevated nuclear reactor spacer grid. 4,416,852., Cl. 376-438.000.

Nystrom Per H. G. On-off valve fluid governed servosystem. 4,416,187., Cl. 91-361.000.

Oak Industries Inc.: *See—*
Larson, Willis A., 4,417,114., Cl. 200-317.000.

Oakley, Inc.: *See—*
Jannard, James H.; and Tackles, George J., 4,416,166., Cl. 74-551.900.

Occhini, Elio; Lanfranconi, Gianmario; and Metra, Piero, to Societa Cavi Pirelli S.p.A. High voltage direct current cable with impregnated tape insulation. 4,417,093., Cl. 174-25.00R.

Occidental Chemical Corporation: *See—*
Siemund, Gunter; and Oei, Han Y., 4,416,705., Cl. 148-6.15Z.

Ochiai, Michihiko: *See—*
Matsuo, Taisuke; and Ochiai, Michihiko, 4,416,817., Cl. 260-239.00A.

Ochii, Kiyofumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Random access semiconductor memory device using MOS transistors. 4,417,328., Cl. 365-203.000.

O'Dwyer, James B.: *See—*
Chang, Wen-Hsuan; O'Dwyer, James B.; and Peffer, John R., 4,417,022., Cl. 524-598.000.

Oeder, Dieter; Dietsche, Wolfram; Weiss, Stefan; Ziegler, Walter; Kueppers, Peter; and Hettche, Albert, to BASF Aktiengesellschaft. Emulsifiable hard waxes consisting of copolymers of ethylene with unsaturated carboxylic acids. 4,417,035., Cl. 526-208.000.

Oei, Han Y.: *See—*
Siemund, Gunter; and Oei, Han Y., 4,416,705., Cl. 148-6.15Z.

Office National d'Etudes et de Recherches Aerospatiales: *See—*
Larigaldie, Serge, 4,417,293., Cl. 361-212.000.
Thibert, Jean-Jacques; Rodde, Anne-Marie; and Pouradier, Jean-Marc E., 4,416,434., Cl. 244-35.00R.

Ogawa, Yoshinari; Akagi, Noriyuki; Ikeda, Kenji; and Nakamura, Yoichi, to Teijin Limited. Flame-retardant resin composition. 4,417,018., Cl. 524-261.000.

Ogura, Osamu: *See—*
Katagiri, Masayoshi; Fujii, Takashi; and Ogura, Osamu, 4,416,188., Cl. 91-369.00B.

Ohara, Muneyuki: *See—*
Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; and Amano, Takayoshi, 4,416,158., Cl. 73-842.000.

Ohara, Yoshio: *See—*
Arai, Kazutaka; Ohara, Yoshio; Takakuwa, Yasuo; and Iizumi, Toyoko, 4,417,070., Cl. 560-56.000.

Ohashi, Kunio: *See—*
Itoh, Ikuo; Anzai, Shunju; and Ohashi, Kunio, 4,416,536., Cl. 355-14.00R.

Ohashi, Minoru; Futaki, Kiyoshi; and Iwaosa, Katsuaki, to Mitsubishi Paper Mills, Ltd. Silver halide photographic photosensitive material. 4,416,977., Cl. 430-446.000.

Ohhara, Takafumi: *See—*
Horiuchi, Naoya; Ohhara, Takafumi; and Sano, Reiji, 4,417,340., Cl. 372-58.000.

Ohkawa, Koue; Fujii, Shin; and Seino, Takashi, to Mitsui Toatsu Chemicals, Inc. Resin composition for bonding foundry sand. 4,417,011., Cl. 523-527.000.

Ohkawa, Takehisa; and Yoda, Kuniichi, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,416,948., Cl. 428-447.000.

Ohkawa, Takehisa: *See—*
Yoda, Kuniichi; and Ohkawa, Takehisa, 4,416,947., Cl. 428-447.000.

Ohno, Ietatsu. Railway bed. 4,416,419., Cl. 238-89.000.

Ohsawa, Michinao: *See—*
Tonomura, Kenichi; Kadokawa, Shigeru; and Ohsawa, Michinao, 4,417,277., Cl. 358-177.000.

Ohta, Yukinori: *See—*
Sato, Kimihiko; Terase, Kunihiko; Kijimuta, Hitoshi; and Ohta, Yukinori, 4,416,863., Cl. 423-344.000.

Ohwada, Masatsugu: *See—*
Katayose, Shinji; Ohwada, Masatsugu; and Oka, Takashi, 4,416,230., Cl. 123-325.000.

Ohya, Kazuo; Fujishima, Hiroki; Ishijima, Norio; Itoga, Hiroyoshi; and Kominami, Yasuhiko, to TDK Electronics Co., Ltd. Amorphous magnetic alloy material. 4,416,709., Cl. 148-403.000.

Oishibashi, Hirotsugu: *See—*
Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; and Amano, Takayoshi, 4,416,158., Cl. 73-842.000.

Oita, Masahiro: *See—*
Nakata, Koreaki; Todoroki, Tsunehiko; Oita, Masahiro; and Oshima, Nobumasa, 4,417,298., Cl. 361-433.000.

Oka, Takashi: *See—*
Katayose, Shinji; Ohwada, Masatsugu; and Oka, Takashi, 4,416,230., Cl. 123-325.000.

Okada, David T.: *See—*
Munson, Leo J.; Griauzde, Felix; Okada, David T.; and Loomis, Bernard, 4,416,455., Cl. 273-272.000.

Okamoto, Yoshihiko: *See—*
Kawai, Yasuhiro; Okamoto, Yoshihiko; Yamamoto, Takaaki; and Kato, Hisatoyo, 4,417,260., Cl. 346-160.000.

Okamura, Toshihiko: *See—*
Ishii, Hirohisa; Shishikura, Masami; and Okamura, Toshihiko, 4,417,167., Cl. 310-67.00R.

Okamura, Yasuhumi; Masaoka, Aritatsu; and Kishita, Kazutaka, to Three Bond Co., Ltd. Anaerobically curable sealing composition. 4,417,040., Cl. 526-323.100.

Okano, Kinpei: *See—*
Tomioka, Shunzo; Okano, Kinpei; Matsuo, Masanori; Hasegawa, Akira; and Kitamura, Akira, 4,416,555., Cl. 384-415.000.

Okazaki, Takuya: *See—*
Kan, Masanori; Okazaki, Takuya; and Sakashita, Tatsuo, 4,417,027., Cl. 525-99.000.

Oki Electric Industry Co., Ltd.: *See—*
Otsuki, Yoshio; Uesugi, Masaru; and Ieda, Nobuaki, 4,417,163., Cl. 307-475.000.

Okuda, Takio; and Sakai, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Liquid joint process. 4,417,119., Cl. 219-72.000.

Okura, Zenichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Apparatus of preventing bound of diaphragm blades in camera. 4,416,527., Cl. 354-272.000.

Olafson, James W.: *See—*
Lybecker, Robert W.; Senghaas, Karl A.; and Olafson, James W., 4,416,085., Cl. 49-340.000.

Olin Corporation: *See—*
Kadija, Igor V., 4,416,757., Cl. 204-252.000.
Thorne-Thomsen, Thomas, 4,416,142., Cl. 72-348.000.
Wojtowicz, John A., 4,416,864., Cl. 423-474.000.

Olofsson, Roland: *See—*
Nordin, Inge, 4,416,320., Cl. 160-177.000.

Olympus Optical Co., Ltd.: *See—*
Fujibayashi, Kenji, 4,417,165., Cl. 307-540.000.
Hagino, Tadao, 4,416,268., Cl. 128-6.000.
Kobayashi, Yuko, 4,416,519., Cl. 350-475.000.
Motoyama, Kazuyasu; Furuta, Kenzi; and Kanayama, Katsumi, 4,417,135., Cl. 377-18.000.
Takayama, Syuichi, 4,416,524., Cl. 354-31.000.

Omley, Herbert A. Apparatus for applying a urine receptacle to a male. 4,416,275., Cl. 128-303.00A.

Ona, Isao: *See—*
Koda, Yoshinobu; Ona, Isao; and Takeda, Atsushi, 4,417,024., Cl. 524-861.000.

Oncor Corporation: *See—*
Garrett, William R., 4,416,476., Cl. 285-286.000.

Onda, Kenichi: *See—*
Fukui, Hiroshi; Kimura, Shin; Onda, Kenichi; and Amano, Hisao, 4,417,156., Cl. 307-252.00C.

O'Neill, David, to O'Neill, Richard P., a part interest. Flat bed side assembly. 4,416,484., Cl. 296-43.000.

O'Neill, Richard P.: *See—*
O'Neill, David, 4,416,484., Cl. 296-43.000.

Ono, Shinsuke: *See—*
Inoue, Yuzuru; Shinozaki, Takashi; Otake, Yoshichi; and Ono, Shinsuke, 4,417,272., Cl. 358-44.000.

Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, to Tokyo Shibaura Denki Kabushiki Kaisha. High frequency switching circuit. 4,417,153., Cl. 307-140.000.

Onuki, Nobuo: *See—*
Hirahata, Shigeru; Takezawa, Teruhiro; Onuki, Nobuo; Komatsu, Shigeru; and Tachiuchi, Tsuguji, 4,417,318., Cl. 364-900.000.

Opprechi, Paul. Transporting can bodies for a fully automated resistance welding machine. 4,417,117., Cl. 219-64.000.

Origoverken I Halmstad Aktiebolag: *See—*
Ebbeson, Bengt E. O., 4,416,617., Cl. 431-326.000.

Orii, Akira: *See—*
Makabe, Hachiro; Tanaka, Haruhiko; and Orii, Akira, 4,417,188., Cl. 318-696.000.

Orosz, Alexander J.: *See—*
Brandsness, Gordon T.; Ebright, Robert L.; and Orosz, Alexander J., 4,416,497., Cl. 339-17.00F.

Osada, Kimio: *See—*
Kamei, Taketo; Hayashi, Motokazu; Osada, Kimio; and Kimura, Mitsutoshi, 4,417,176., Cl. 315-59.000.

Osaka, Susumu: *See—*
Toda, Minoru; and Osaka, Susumu, 4,417,169., Cl. 310-317.000.

Osaka University, The President of: *See—*
Yamanaka, Chiyoe; Kato, Yoshiaki; Yoshida, Kunio; and Yoshida, Eiji, 4,417,341., Cl. 372-72.000.

Osborne, Duncan W., to Automotive Products Limited. Hydraulic wheel cylinder assemblies and drum brakes incorporating same. 4,416,356., Cl. 188-326.000.

Oshima, Hiroto: *See—*
Hasegawa, Masakazu; Takaoka, Michio; Oshima, Hiroto; and Kataoka, Keiichiro, 4,416,601., Cl. 425-68.000.

Oshima, Nobumasa: *See—*
Nakata, Koreaki; Todoroki, Tsunehiko; Oita, Masahiro; and Oshima, Nobumasa, 4,417,298., Cl. 361-433.000.

Ostberg, Sven E., to Kockums Industri A.B. Guiding mechanism for timber cutting machines. 4,416,312., Cl. 144-39.000.

Ostermaier, John J., to Du Pont de Nemours, E. I., and Company. Preparation of zerovalent nickel complexes. 4,416,825., Cl. 260-439.00R.

Ostlund, Ole C. Method and column for collection and separation of oil, gas and water from blowing wells at the sea bed. 4,416,565., Cl. 405-60.000.

Ota, Chuichi: *See—*
Tanaka, Shinsuke; Imamura, Nobutake; and Ota, Chuichi, 4,417,290., Cl. 360-131.000.

Otake, Eiji, to Konishiroku Photo Industry Co., Ltd. Photodetector device for detecting the front and rear ends of a moving sheet. 4,417,148., Cl. 250-561.000.

Otake, Yoshichi: *See—*
Inoue, Yuzuru; Shinozaki, Takashi; Otake, Yoshichi; and Ono, Shinsuke, 4,417,272., Cl. 358-44.000.

Otis Engineering Corporation: *See—*
Merritt, David T.; Fish, David W.; and Long, Olen R., 4,416,330., Cl. 166-117.500.

Otsuka Pharmaceutical Co., Ltd.: *See—*
Ishikawa, Hiroshi; Tabusa, Fujio; and Nakagawa, Kazuyuki, 4,416,884., Cl. 424-250.000.

Otsuki, Yoshio; Uesugi, Masaru; and Ieda, Nobuaki, to Oki Electric Industry Co., Ltd.; and Nippon Telegraph and Telephone Public Corporation. Buffer circuits. 4,417,163., Cl. 307-475.000.

Ott, Karl-Heinz: *See—*
Lindner, Christian; Binsack, Rudolf; Rempel, Dieter; and Ott, Karl-Heinz, 4,417,026., Cl. 525-64.000.

Otte, Timothy J., to Bemis Manufacturing Company. Toilet seat mounting arrangement. 4,416,048., Cl. 29-526.00R.

Ottolini, Leonardo, to Luigi Franchi S.p.A. Device for retaining cartridges in the magazine of a semi-automatic shotgun during a replacement of the cartridge in the firing chamber. 4,416,076., Cl. 42-17.000.

Ousby, John C.: *See—*
Bailey, Martin; Hines, David A.; Ousby, John C.; Roesler, Frank C., deceased; and Roesler, Johanna M., executrix, 4,416,781., Cl. 210-629.000.

Outboard Marine Corporation: *See—*
Ghandhi, Burzoe K., 4,416,108., Cl. 56-17.500.
Kashmerick, Gerald E.; and Zdanowicz, Lawrence E., 4,416,637., Cl. 440-60.000.

Ovens, Christopher: *See—*
Newton, David W.; Hulett, Frederic M., III; and Ovens, Christopher, 4,416,277., Cl. 128-303.130.

Overfield, Dennis O., to Perkin-Elmer Corporation, The. Control circuit for stepper motor. 4,417,189., Cl. 318-696.000.

Overman, Joseph D., to Du Pont de Nemours, E. I., and Company. Benzothiazoline derivatives as silver halide antifoggants. 4,416,981., Cl. 430-614.000.

Ovren, Christer: *See—*
Adolfsson, Morgan; Brogardh, Torgny; and Ovren, Christer, 4,417,140., Cl. 250-227.000.

Owaki, Shinji: *See—*
Kimura, Akio; Wada, Osamu; Owaki, Shinji; and Seimitsu, Kozo, 4,416,934., Cl. 428-224.000.

Owens-Illinois, Inc.: *See—*
Deardurff, Lawrence R., 4,416,608., Cl. 425-548.000.

Owsen, Paul J., to Century Specialties, Inc. Auxiliary support fixture for a steady rest. 4,416,174., Cl. 82-38.00R.

Oximetrix, Inc.: *See—*
Shaw, Robert F.; and Sperinde, John, 4,416,285., Cl. 128-634.000.

Oy Lohja Ab: *See—*
Antson, Jorma O.; Lindfors, Sven G.; Pakkala, Arto J.; Skarp, Jarmo I.; Suntola, Tuomo S.; and Ylilammi, Markku A., 4,416,933., Cl. 428-216.000.

Oyama, Kohei; and Yokouchi, Hiroyuki, to Alps Electric Co., Ltd. Printed circuit board. 4,417,297., Cl. 361-412.000.

Ozawa, Takashi: *See—*
Morigaki, Masakazu; Yagihara, Morio; and Ozawa, Takashi, 4,416,978., Cl. 430-548.000.

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Knapp, Heinrich; Romann, Peter; and Sauer, Rudolf, 4,416,241., Cl. 123-494.000.
Krauss, Rudolf; and Hafner, Udo, 4,416,423., Cl. 239-585.000.
Straubel, Max, 4,416,233., Cl. 123-383.000.

Robert Keith & Co., Inc.: *See—*
Vicino, Robert K.; and Bachman, Mark S., 4,416,073., Cl. 40-326.000.

Robinson, Daniel E.: *See—*
Cueto, Agustin; and Robinson, Daniel E., 4,417,196., Cl. 323-210.000.

Robinson, Lee F.; and Porcari, Giuliano, to RTL Contactor Holding S.A. Contactor. 4,416,858., Cl. 422-259.000.

Robinson, Leon H., Jr.: *See—*
Watkins, Larry A.; and Robinson, Leon H., Jr., 4,416,494., Cl. 339-15.000.

Rock-Tenn Company: *See—*
Wischusen, Henry, III, 4,416,412., Cl. 229-41.00R.

Rockwell International Corporation: *See—*
Barkhoudarian, Sarkis, 4,416,161., Cl. 73-862.360.
Best, David W., 4,417,314., Cl. 364-716.000.
Best, David W., 4,417,316., Cl. 364-770.000.
Russell, Jeffrey D., 4,417,315., Cl. 364-770.000.
Sarace, John C., 4,416,050., Cl. 29-571.000.

Rocquin, Camille J. Attachable carrier handle and pick-up apparatus. 4,416,479., Cl. 294-1.00B.

Rocroi, Jean-Pierre; and Gole, Francois, to Compagnie Generale de Geophysique. Method of geophysical prospection using transient currents. 4,417,210., Cl. 324-336.000.

Rodde, Anne-Marie: *See—*
Thibert, Jean-Jacques; Rodde, Anne-Marie; and Pouradier, Jean-Marc E., 4,416,434., Cl. 244-35.00R.

Roder, Albert; Siedel, Joachim; Mollering, Hans; Seidel, Hans; and Gauhl, Helmgard, to Boehringer Mannheim GmbH. Determination of NAD(P)H or salicylate. 4,416,983., Cl. 435-25.000.

Roesler, Frank C., deceased: *See—*
Bailey, Martin; Hines, David A.; Ousby, John C.; Roesler, Frank C., deceased; and Roesler, Johanna M., executrix, 4,416,781., Cl. 210-629.000.

Roesler, Johanna M., executrix: *See*—
Bailey, Martin; Hines, David A.; Ousby, John C.; Roesler, Frank C., deceased; and Roesler, Johanna M., executrix, 4,416,781., Cl. 210-629.000.
Rogers, Charles H., to Neocyte, Inc. Means for preparing neocyte enriched blood. 4,416,778., Cl. 210-516.000.
Rohrbach, Ronald P.: *See*—
Arena, Blaise J.; and Rohrbach, Ronald P., 4,416,992., Cl. 435-176.000.
Rolls Royce Limited: *See*—
Goddard, John; and Mills, David, 4,416,321., Cl. 164-80.000.
Turner, Wallace, 4,416,739., Cl. 204-32.00R.
Romacker, Bertold, to Telefunken Electronic GmbH. Arrangement for orientation during journeys in land vehicles. 4,416,066., Cl. 33-318.000.
Romann, Peter: *See*—
Knapp, Heinrich; Romann, Peter; and Sauer, Rudolf, 4,416,241., Cl. 123-494.000.
Romano, Dennis J.: *See*—
Eickenhorst, Jay P., 4,416,640., Cl. 441-81.000.
Ronnow, Peter H.: *See*—
Wiberger, Lars I.; Ronnow, Peter H.; Tengblad, Per F.; and Hellman, Bert G. H., 4,416,332., Cl. 166-246.000.
Rooklyn, Jack, to Industrial Management Co. Conveyor bench/work station with shunt. 4,416,202., Cl. 104-88.000.
Rosati, Alfonso A., to International Business Machines Corporation. Latching and tensioning mechanism for closed-loop belt supporting capstan. 4,416,532., Cl. 355-3.0BE.
Rosen, Howard N.; Bodkin, Robert E.; and Gaddis, Kenneth D., to United States of America, Agriculture. Enhancement of color quality of lumber during drying. 4,416,069., Cl. 34-13.800.
Rosenberger, Siegfried, to Ciba-Geigy Corporation. Phenols useful as stabilizers. 4,417,071., Cl. 560-67.000.
Rosman, Herman: *See*—
Weintraub, Morton; Waxman, Elliot; and Gendelman, Bernard, 4,417,200., Cl. 323-347.000.
Ross, David S.; Johnson, Robert M., Jr.; and Malhotra, Ripudaman, to Air Products and Chemicals, Inc. Solvent modification of nitrations by N_2O_4/metal acetylacetonate systems. 4,417,080., Cl. 568-939.000.
Ross, Michael E., to Federal Pacific Electric Co. Time delay fuse. 4,417,224., Cl. 337-164.000.
Rossie, Egbert: *See*—
Feucht, Klaus J.; Rossie, Egbert; and Bauer, Karl, 4,416,088., Cl. 49-502.000.
Roth, Kurt: *See*—
Tappe, Horst; and Roth, Kurt, 4,416,665., Cl. 8-464.000.
Roth, Martin: *See*—
Lohmann, Dieter; Roth, Martin; and Baumann, Marcus, 4,417,057., Cl. 548-429.000.
Rottger, Wilhelm: *See*—
Bugener, Franz; Rinklake, Manfred; Horch, Werner; Rottger, Wilhelm; Jost, Gunter; and Kirsch, Johann, 4,416,094., Cl. 52-72.000.
Rottmayr, Josef: *See*—
Fiergolla, Ulrich; and Rottmayr, Josef, 4,416,099., Cl. 52-319.000.
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J. Catalyst and process for dehydrogenation of oxygen-containing derivatives of the cyclohexane series into corresponding cyclic ketones and/or phenols. 4,417,076., Cl. 568-361.000.
RTL Contactor Holding S.A.: *See*—
Robinson, Lee F.; and Porcari, Giuliano, 4,416,858., Cl. 422-259.000.
Rubel, Frederick, Jr.: *See*—
Hager, Donald G.; Massey, Michael L.; and Rubel, Frederick, Jr., 4,416,798., Cl. 502-420.000.
Rubin, Harvey. Detection and isolation of enkephalin mRNA using a synthetic oligodeoxynucleotide. 4,416,988., Cl. 435-91.000.
RUD-Kettenfabrik Rieger & Dietz GmbH u. Co.: *See*—
Hofmann, Peter, 4,416,319., Cl. 152-213.00R.
Rieger, Hansjorg; and Holzwarth, Dietmar H., 4,416,318., Cl. 152-213.00A.
Rudolf Riester GmbH & Co., KG: *See*—
Riester, Karlheinz, 4,416,287., Cl. 128-685.000.
Rumble, Clive, to Corabelment A.G. Electrical connector. 4,416,502., Cl. 339-103.00M.
Rupp, John W. Fishing pole light. ,417,299., Cl. 362-186.000.
Rushby, Robert J.; and Damms, Anthony B., to NCR Canada Ltd - NCR Canada Ltee. Method and apparatus for improving bank operation productivity. 4,417,136., Cl. 235-379.000.
Russell, Burdsall & Ward Corporation: *See*—
Rebish, Edward J., 4,416,173., Cl. 81-185.000.
Russell, Frank S., to Sleeper & Hartley Corp. Wire coiling machine. 4,416,135., Cl. 72-130.000.
Russell, Jeffrey D., to Rockwell International Corporation. Method and apparatus for incrementing a digital word. 4,417,315., Cl. 364-770.000.
Russo, Carl J.: *See*—
Muka, Richard S.; and Russo, Carl J., 4,417,347., Cl. 373-158.000.
Ryan, Lawrence A., to Phillips Petroleum Company. Fractional distillation column control. 4,417,311., Cl. 364-501.000.
Ryan Metal Powder Technologies, Inc.: *See*—
Lecznar, Chester J.; and Williams, Griff E., 4,416,600., Cl. 425-7.000.
Ryan, Robert A., deceased: *See*—
Breski, Thomas A.; and Ryan, Robert A., deceased, 4,416,653., Cl. 493-412.000.
Ryan, Robert C.: *See*—
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S. W. Hart & Co. Pty. Ltd.: *See*—
Korwill, Ferdinand C., 4,416,256., Cl. 126-427.000.
SAB Industri AB: *See*—
Wikstrom, Bo B., 4,417,324., Cl. 365-10.000.
Sabon, Robert J.; and Vonder, David L., to GTE Automatic Electric Labs. Inc. Detection apparatus utilizing a hall effect device. 4,417,205., Cl. 324-133.000.
Sado, Ryoichi; and Tahara, Kazutoki, to Shin-Etsu Polymer Co., Ltd. Socket-type connectors for electric connectors. 4,416,498., Cl. 339-60.00R.
Safetran Systems Corporation: *See*—
Wilson, H. James, 4,417,229., Cl. 340-47.000.
Saffa S.p.A.: *See*—
Albanesi, Giancarlo; and Rinaldi, Gianfranco, 4,416,728., Cl. 162-159.000.
Sage, Paul, to Verdol S.A. Double-lift Jacquard mechanism. 4,416,310., Cl. 139-59.000.
Sagishima, Takayuki: *See*—
Nakase, Yoshimori; and Sagishima, Takayuki, 4,417,271., Cl. 358-24.000.
Saida, Takashi: *See*—
Takimoto, Masaaki; Saida, Takashi; and Murata, Masataka, 4,416,963., Cl. 430-69.000.
St. Regis Paper Company: *See*—
Fridhandler, Robert M., 4,416,922., Cl. 427-361.000.
Saito, Hitoshi: *See*—
Takeda, Minoru; Nitta, Toshimi; and Saito, Hitoshi, 4,416,390., Cl. 220-273.000.
Saito, Motoyuki; and Fukutome, Satoru, to Citizen Watch Company Limited. Structure of push-button device. 4,417,113., Cl. 200-302.000.
Saito, Seitoku, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,416,943., Cl. 428-333.000.
Saito, Shozo; and Suzumura, Takeshi, to Hitachi, Ltd. Method and apparatus for detecting failure of nuclear fuel. 4,416,847., Cl. 376-253.000.
Saito, Tsutomu: *See*—
Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Tanaka, Kazutoshi, 4,417,228., Cl. 338-34.000.
Sakabe, Toshiaki: *See*—
Suzuki, Kiyohisa; Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; Ban, Hiroshi; and Ishida, Nobuyasu, 4,416,361., Cl. 192-107.00M.
Sakai Chemical Industry Co., Ltd.: *See*—
Abe, Kazunobu; and Nakatsuji, Tadao, 4,416,800., Cl. 502-159.000.
Sakai, Junichi: *See*—
Okuda, Takio; and Sakai, Junichi, 4,417,119., Cl. 219-72.000.
Sakakibara, Yukio: *See*—
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,416,235., Cl. 123-425.000.
Sakamoto, Fumio; Ikeda, Shoji; and Tsukamoto, Goro, to Kanebo Ltd. Ester of 6-[(hexahydro-1H-azepin-1-yl)methyleneamino]penicillanic acid, and its use as antibacterial agent. 4,416,891., Cl. 424-270.000.
Sakashita, Tatsuo: *See*—
Kan, Masanori; Okazaki, Takuya; and Sakashita, Tatsuo, 4,417,027., Cl. 525-99.000.
Sakiya, Fumio, to Tazmo Co., Ltd. Rotary coating apparatus. 4,416,213., Cl. 118-52.000.
Sakuma, Shinzo: *See*—
Yanagisawa, Hifumi; Warabi, Junichi; and Sakuma, Shinzo, 4,417,110., Cl. 200-144.00B.
Sakurai, Shinjiro: *See*—
Matsuda, Tsutomu; Hirabayashi, Takeo; Yanagihara, Takeshi; and Sakurai, Shinjiro, 4,416,967., Cl. 430-159.000.
Salensky, George A.; Chopra, Kuldip S.; and Pappas, Nicholas J., to Elkem Metals Company. Zinc rich paint formulations employing manganomanganic oxide fume pigment. 4,417,007., Cl. 523-442.000.
Salensky, George A.; Chopra, Kuldip S.; and Pappas, Nicholas J., to Elkem Metals Company. Improved color pigment for solvent-base paint formulations. 4,417,008., Cl. 523-442.000.
Salim, Hamid. Indexed pipe. 4,416,309., Cl. 138-104.000.
Salisbury, Winfield W., to Energy Profiles, Inc. Control for orbiting charged particles. 4,416,845., Cl. 376-107.000.
Salkeld, Stephen A.; and Stock, Mark E., to Litton Business Systems, Inc. Panel system interconnecting means. 4,416,093., Cl. 52-71.000.
Sami, Hiroshi: *See*—
Shiozaki, Makoto; Haseda, Satoshi; Tarui, Jun; Ito, Osamu; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Kawai, Shizuo; and Sami, Hiroshi, 4,416,232., Cl. 123-357.000.
Sammons, David W.: *See*—
Adams, Lonnie D.; and Sammons, David W., 4,416,998., Cl. 436-86.000.
Samotryasov, Sergei M.: *See*—
Kuchuk-Yatsenko, Sergei I.; Bogorsky, Mikhail V.; and Samotryasov, Sergei M., 4,417,121., Cl. 219-104.000.
Samuelsen, Sigvart J.: *See*—
Lumbra, Douglas L.; Phelps, Douglas W., Jr.; Samuelsen, Sigvart J.; and Ward, William C., 4,417,120., Cl. 219-96.000.
Sanders, Frederick W.; Wright, Richard F.; and Adair, Paul C., to Mead Corporation, The. Capsular imaging system comprising decolorizing agent. 4,416,966., Cl. 430-138.000.

Sanders, George G.: *See—*
Cunningham, Douglas J.; and Sanders, George G., 4,416,469., Cl. 280-804.000.

Sanderson, Roger S.; and Whelchel, Robert C., to Sanderson, Roger S. Sterilized storage container. 4,416,417., Cl. 236-92.00R.

Sandhu, M. Akram; Wright, John F.; and Molaire, Michel F., to Eastman Kodak Company. Electrostatographic developers comprising toners containing a polyester having p-hydroxybenzoic acid recurring units. 4,416,965., Cl. 430-109.000.

Sando Iron Works Co., Ltd.: *See—*
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,416,123., Cl. 68-5.00E.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Apparatus for wet heat treating a textile product. 4,416,123., Cl. 68-5.00E.

Sandoz, Inc.: *See—*
Barcza, Sandor; and Kathawala, Faizulla G., 4,416,876., Cl. 424-184.000.

Sandoz Ltd.: *See—*
Buecheler, Paul, 4,417,014., Cl. 524-90.000.
Grossmann, Hans, 4,416,816., Cl. 260-151.000.
Schuster, Johann, 4,417,013., Cl. 524-87.000.
Woodhouse, Christopher R. J., 4,416,894., Cl. 424-273.00R.

Sanford, Herbert F., to Honeywell Inc. Centrifugally controlled differential tape reel brake. 4,416,355., Cl. 188-185.000.

Sanner, Johnny W. Fuel tank having an immersion heating element assembly. 4,417,133., Cl. 219-316.000.

Sano, Reiji: *See—*
Horiuchi, Naoya; Ohhara, Takafumi; and Sano, Reiji, 4,417,340., Cl. 372-58.000.

Sanyo Denki Kabushiki Kaisha: *See—*
Maeda, Junji, 4,417,259., Cl. 346-140.00R.

Sapone, Martin: *See—*
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Sarace, John C., to Rockwell International Corporation. Method of fabrication of dielectrically isolated CMOS devices. 4,416,050., Cl. 29-571.000.

Sargent, Donald J., to E/M Lubricants, Inc. Metal forming lubricant and method of use thereof. 4,416,132., Cl. 72-41.000.

Sarin, Vinod K.; Buljan, Sergej-Tomislav; and D'Angelo, Charles, to GTE Laboratories Incorporated. Carbide coated composite silicon nitride cutting tools. 4,416,670., Cl. 51-295.000.

Sarkissian, Vahe, to Touchwood International S.A. Heel and sole assembly for an adjustable arch shoe. 4,416,072., Cl. 36-100.000.

Sarnoff, Norton: *See—*
Chmela, John F.; Fletcher, Carl R.; and Sarnoff, Norton, 4,416,171., Cl. 81-3.46R.

Sarrazin, Jean-Michel, to Compagnie des Produits Industriels de l'Ouest. Seals-caps for fuel tanks. 4,416,391., Cl. 220-304.000.

Sartorius GmbH: *See—*
Knothe, Erich; Blawert, Dieter; and Schubart, Bernd, 4,416,343., Cl. 177-180.000.

Sasso, Albert. Regular solid multi-colored puzzle. 4,416,453., Cl. 273-155.000.

Sato, Ichitaro, to Sony Corporation. Gain control circuit for a video tape recorder wherein the chrominance is gain controlled in response to the luminance signal as well as the chrominance signal. 4,417,284., Cl. 358-316.000.

Sato, Kimihiko; Terase, Kunihiko; Kijimuta, Hitoshi; and Ohta, Yukinori, to Asahi Glass Company Ltd. Method for synthesizing amorphous silicon nitride. 4,416,863., Cl. 423-344.000.

Sato, Shigeru: *See—*
Iinuma, Kazuhiro; Seo, Yasutsugu; and Sato, Shigeru, 4,416,286., Cl. 128-663.000.

Sato, Takashi; Mukai, Makoto; Nagata, Shiro; Harada, Yoshimichi; and Kirita, Yasuzo, to Kuraray Co., Ltd. Apparatus for concentrating and filtering body cavity fluids. 4,416,772., Cl. 210-137.000.

Sato, Tetuo: *See—*
Narita, Kiichi; Tomita, Akitsu; Katagiri, Nozomu; Seki, Kazuyuki; Sato, Tetuo; Kitamura, Minoru; Kawasaki, Shozo; and Kanazuka, Yasuo, 4,416,691., Cl. 75-60.000.

Sato, Yoshiro, to Tohoku Metal Industries, Ltd. Circuit for injecting simulating-noise signals in a power line. 4,417,207., Cl. 324-158.00R.

Sauer, Gerhard, to Schering, Aktiengesellschaft. Process for the preparation of 8α-substituted 6-methylergolines. 4,417,051., Cl. 546-67.000.

Sauer, Rudolf: *See—*
Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, 4,416,238., Cl. 123-470.000.
Knapp, Heinrich; Romann, Peter; and Sauer, Rudolf, 4,416,241., Cl. 123-494.000.

Saulson, Stanley H.; and Tarjan, Peter P., to Cordis Corporation. Cardiac pacer with improved, output circuitry. 4,416,282., Cl. 128-419.0PG.

Sawafuji Electric Company, Ltd.: *See—*
Ichikawa, Kaoru, 4,416,594., Cl. 417-360.000.

Sawai, Masanobu: *See—*
Enomoto, Shogo; Sawai, Masanobu; Seo, Iwao; and Yamaguchi, Tomonobu, 4,416,269., Cl. 128-41.000.

Sawai, Yoneichi: *See—*
Fujii, Setsuro; Yasui, Bompei; Nakamura, Mitsuo; Miyamoto, Tomohisa; Ando, Kazuko; Hashimoto, Iwao; Sawai, Yoneichi; Umeda, Naoki; and Kawasaki, Masahiro, 4,416,875., Cl. 424-180.000.

Sawamura, Norio: *See—*
Matsuo, Takaharu; Sawamura, Norio; Hashimoto, Yukio; and Hashida, Wataru, 4,416,991., Cl. 435-134.000.

Schade, Otto H., Jr., to RCA Corporation. Offset compensation apparatus for biasing an analog comparator. 4,417,160., Cl. 307-353.000.

Schafer, Tann R.: *See—*
D'Amico, John J.; and Schafer, Tann R., 4,416,687., Cl. 71-109.000.

Schafer, Walter: *See—*
Berghammer, Conrad; Schafer, Walter; and Stuhler, Rolf, 4,416,298., Cl. 132-33.00R.

Schaffer, Arnold M.; and Gallagher, Joseph G., Jr., to Phillips Petroleum Company. Method for measuring the surface area of a solid. 4,416,154., Cl. 73-571.000.

Schaich, Eugen: *See—*
Becker, Udo; Schaich, Eugen; and Weigert, Manfred, 4,416,812., Cl. 260-112.00R.

Scheffers, Richard W.; and Boeckmann, Hugo, to Signode Corporation. Bag package and related method. 4,416,376., Cl. 206-554.000.

Schelhorn, Robert L. Method of connecting surface mounted packages to a circuit board and the resulting connector. 4,417,296., Cl. 361-386.000.

Schell, Loni, to Hoechst Aktiengesellschaft. Developer solution for the development of exposed negative-working diazonium salt layers. 4,416,976., Cl. 430-331.000.

Schenk, Norbert, to Rheinmetall GmbH. Alternate ammunition belt feeder of an automatic fire arm having a linear breech. 4,416,185., Cl. 89-33.0SF.

Scherer, Hartmut; and Thilo, Peer, to Siemens Aktiengesellschaft. Correction method and device for a magnetic field probe. 4,416,067., Cl. 33-356.000.

Schering, Aktiengesellschaft: *See—*
Petzoldt, Karl; Wiechert, Rudolf; Laurent, Henry; Nickisch, Klaus; and Bittler, Dieter, 4,416,985., Cl. 435-58.000.
Sauer, Gerhard, 4,417,051., Cl. 546-67.000.

Scherzer, Hugo: *See—*
Diederich, Herbert; Gaffal, Karl; and Scherzer, Hugo, 4,416,586., Cl. 417-13.000.

Scheurenbrand, Dieter, to Daimler-Benz Aktiengesellschaft. Motor vehicle fuel tank. 4,416,303., Cl. 137-576.000.

Scheve, Bernard J., to Hercules Incorporated. Radiation curable ceramic pigment composition. 4,416,974., Cl. 430-288.000.

Schiavone, Lawrence M.: *See—*
Beni, Gerardo; and Schiavone, Lawrence M., 4,416,516., Cl. 350-357.000.

Schiedel GmbH & Co.: *See—*
Schurmann, Helmut; and Brand, Erich, 4,416,790., Cl. 252-62.000.

Schiel, Christian, to J. M. Voith GmbH. Wire end section of a paper making machine. 4,416,730., Cl. 162-264.000.

Schilling, Walter: *See—*
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,417,058., Cl. 548-451.000.

Schinzel, Erich: *See—*
Martini, Thomas; Frischkorn, Hans; Schinzel, Erich; and Probst, Heinz, 4,416,795., Cl. 252-301.230.

Schlembach, Hans: *See—*
Benedikt, Walter; Latsch, Reinhard; and Schlembach, Hans, 4,416,228., Cl. 123-268.000.

Schlosser, Erich J., to Weber-Stephen Products Co. Ash disposal damper for barbecue kettle. 4,416,248., Cl. 126-9.00B.

Schlumberger Technology Corporation: *See—*
Ullo, John J., 4,416,151., Cl. 73-152.000.

Schmelzer Corporation: *See—*
Detweiler, Charles A., 4,416,307., Cl. 137-625.660.

Schmidt, Delf: *See—*
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,416,870., Cl. 424-172.000.

Schmidt, Friedrich: *See—*
Feyen, Peter; and Schmidt, Friedrich, 4,416,834., Cl. 260-979.000.

Schmidt, Helmut, to Siemens Aktiengesellschaft. Method and circuit for D.C. braking a three-phase asynchronous machine. 4,417,191., Cl. 318-760.000.

Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. Diphenylamino and indolyl substituted pyromellitides. 4,417,059., Cl. 548-456.000.

Schmitmann, Herbert, to Siemens Aktiengesellschaft. Rotary anode x-ray tube. 4,417,171., Cl. 313-16.000.

Schmitt, Herrmann; Sellner, Rudolf; and Greefe, Klaus, to Brown, Boveri & Co. Aktiengesellschaft. Circuit breaker. 4,417,222., Cl. 335-6.000.

Schnell, Axel: *See—*
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, 4,417,227., Cl. 338-21.000.

Schoendorfer, Donald W.; and Hansen, Lee E., to Haemonetics Corporation. Pheresis apparatus. 4,416,654., Cl. 494-10.000.

Schoepe, Adolf. Selectively foldable side inlet ballcock. 4,416,302., Cl. 137-315.000.

Schonafinger, Karl; Beyerle, Rudi; Mogilev, Anton; Bohn, Helmut; Martorana, Piero; and Nitz, Rolf-Eberhard, to Cassella Aktiengesellschaft. Substituted 1,2,5-oxadiazole-2-oxides in human cardiovascular system disease. 4,416,893., Cl. 424-272.000.

Schramm, Arthur G.; and Shaffer, Jack C., to Hardy, Doralyn Ann. Method and apparatus for fabricating insulative panel. 4,416,715., Cl. 156-210.000.

Schramm, Manfred: *See—*
Vogel, Hans-Henning; Schramm, Manfred; Werner, Michael; and Schwartz, Erich, 4,417,038., Cl. 526-285.000.

Schreck, Carl E.: *See—*
McGovern, Terrence P.; and Schreck, Carl E., 4,416,881., Cl. 424-248.540.

Schreinemacher, Herbert: *See—*
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, 4,417,227., Cl. 338-21.000.

Schroder, Theo: *See—*
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,416,870., Cl. 424-172.000.

Schubart, Bernd: *See—*
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Schuck, David B.: *See—*
Gunderson, Robert O.; Kocol, James E.; and Schuck, David B., 4,417,334., Cl. 370-85.000.

Schulze-Berge, Klaus, to Langbein-Pfanhauser Werke AG. Method and bath for the electrodeposition of palladium/nickel alloys. 4,416,740., Cl. 204-43.00N.

Schulze-Berge, Klaus, to Langbein-Pfanhauser Werke AG. Method and bath for the electrodeposition of palladium/nickel alloys. 4,416,741., Cl. 204-43.00N.

Schurmann, Helmut; and Brand, Erich, to Schiedel GmbH & Co. Paste-like damping medium and method for its manufacture. 4,416,790., Cl. 252-62.000.

Schuster, Allan C.; and Schuster, Georgia L. Insulating window insert. 4,416,096., Cl. 52-202.000.

Schuster, Georgia L.: *See—*
Schuster, Allan C.; and Schuster, Georgia L., 4,416,096., Cl. 52-202.000.

Schuster, Johann, to Sandoz Ltd. Pigment compositions containing acrylate copolymers. 4,417,013., Cl. 524-87.000.

Schutz, Hans U.; and Buhler, Arthur, to Ciba-Geigy Corporation. Fiber-reactive unsymmetrical 1:2 chromium complex azo dyes. 4,416,815., Cl. 260-145.00A.

Schwartz, Erich: *See—*
Vogel, Hans-Henning; Schramm, Manfred; Werner, Michael; and Schwartz, Erich, 4,417,038., Cl. 526-285.000.

Schwartz, Jack M. Yarn feeding apparatus. 4,416,205., Cl. 112-79.00R.

Schwartz, Robert C., to Horn & Gladden Lint Cleaner Company, Inc. Safety bar cutoff and brake. 4,416,035., Cl. 19-0.200.

Schwarz, Francisc C. Electronic system for simultaneous control of two or more pulse modulators. 4,417,197., Cl. 323-272.000.

Schwarz, Richard A., to Cosden Technology, Inc. Foamable polymeric styrene particles. 4,417,003., Cl. 521-56.000.

Schwarze, Rigobert. Pipe-bending machine. 4,416,136., Cl. 72-157.000.

SCM Corporation: *See—*
Loye, Kenneth; and Julian, Gary, 4,416,940., Cl. 428-324.000.

Scott, J. A. N.: *See—*
Graiff, L. B.; Murphy, Z. L.; and Scott, J. A. N., 4,416,669., Cl. 44-71.000.

Scott, Paul R., to Shell Oil Company. System for removing debris from pipelines. 4,416,703., Cl. 134-8.000.

Scribano, Frank C.: *See—*
Haas, Werner J.; and Scribano, Frank C., 4,417,143., Cl. 250-363.00S.

Seaquist Valve Co., Div. of Pittway Corp.: *See—*
Knickerbocker, Michael G., 4,416,398., Cl. 222-402.130.

Sebag, Henri: *See—*
Vanlerberghe, Guy; and Sebag, Henri, 4,416,868., Cl. 424-59.000.

Secamiglio, Anthony J.: *See—*
Secamiglio, John J.; Secamiglio, Edward T.; and Secamiglio, Anthony J., 4,416,255., Cl. 126-422.000.

Secamiglio, Edward T.: *See—*
Secamiglio, John J.; Secamiglio, Edward T.; and Secamiglio, Anthony J., 4,416,255., Cl. 126-422.000.

Secamiglio, John J.; Secamiglio, Edward T.; and Secamiglio, Anthony J., to Sun Powered Inc. Wedge-shaped solar air heating device. 4,416,255., Cl. 126-422.000.

Sedlar, Michael F.: *See—*
Popard, Earl E.; Sedlar, Michael F.; and Davidson, Gary W., 4,417,183., Cl. 315-291.000.

Seeger, Richard E., to Armatron International, Inc. Double acting log splitter. 4,416,313., Cl. 144-193.00R.

Seeger, Richard O.: *See—*
Dorler, Jack A.; Mosley, Joseph M.; Seeger, Richard O.; and Weitzel, Stephen D., 4,417,159., Cl. 307-270.000.

Sei, Kazuo: *See—*
Yamamoto, Noboru; Morikubo, Keiichi; Komatsu, Masato; and Sei, Kazuo, 4,417,019., Cl. 524-456.000.

Seibel, David, to Perkin-Elmer Corporation, The. Rotary feedthru control. 4,416,354., Cl. 188-166.000.

Seidel, Hans: *See—*
Roder, Albert; Siedel, Joachim; Mollering, Hans; Seidel, Hans; and Gauhl, Helmgard, 4,416,983., Cl. 435-25.000.

Seimitsu, Kozo: *See—*
Kimura, Akio; Wada, Osamu; Owaki, Shinji; and Seimitsu, Kozo, 4,416,934., Cl. 428-224.000.

Seino, Takashi: *See—*
Ohkawa, Koue; Fujii, Shin; and Seino, Takashi, 4,417,011., Cl. 523-527.000.

Seki, Kazuyuki: *See—*
Narita, Kiichi; Tomita, Akitsu; Katagiri, Nozomu; Seki, Kazuyuki; Sato, Tetuo; Kitamura, Minoru; Kawasaki, Shozo; and Kanazuka, Yasuo, 4,416,691., Cl. 75-60.000.

Sekiya, Toshifumi: *See—*
Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Tanaka, Kazutoshi, 4,417,228., Cl. 338-34.000.

Selas Corporation of America: *See—*
Morck, Charles W., 4,416,620., Cl. 431-348.000.

Sellner, Rudolf: *See—*
Schmitt, Herrmann; Sellner, Rudolf; and Greefe, Klaus, 4,417,222., Cl. 335-6.000.

Senghaas, Karl A.: *See—*
Lybecker, Robert W.; Senghaas, Karl A.; and Olafson, James W., 4,416,085., Cl. 49-340.000.

Senko Medical Instrument Mfg. Co.: *See—*
Numazawa, Masaaki; Tashiro, Hidetaka; and Ishii, Shuichi, 4,416,658., Cl. 604-48.000.

Seo, Iwao: *See—*
Enomoto, Shogo; Sawai, Masanobu; Seo, Iwao; and Yamaguchi, Tomonobu, 4,416,269., Cl. 128-41.000.

Seo, Yasutsugu: *See—*
Iinuma, Kazuhiro; Seo, Yasutsugu; and Sato, Shigeru, 4,416,286., Cl. 128-663.000.

Sergeev, Stanislav S.: *See—*
Likhogub, Evgeny P.; Sergeev, Stanislav S.; and Minasov, Alexandr N., 4,416,733., Cl. 202-228.000.

Serrano, Francisco D. M.: *See—*
Lamy, Jacques E.; Michel, Dominique; and Serrano, Francisco D. M., 4,416,473., Cl. 285-41.000.

Serres, Bernard M.; Viale, Maurice S.; and Jewiarz, Edouard J. Public telephone station traffic analyzing arrangement. 4,417,101., Cl. 179-8.00R.

Sevastopoulos, Stylianos G.; and Lum, Sammy S., to National Semiconductor Corporation. Monolithic IC general purpose active filter. 4,417,214., Cl. 330-84.000.

Sexton Can Company, Inc.: *See—*
Mulawski, Walter J., 4,416,388., Cl. 220-207.000.

Seyb, Christian: *See—*
Dehmel, Rudiger; Maelzer, Martin; and Seyb, Christian, 4,417,204., Cl. 324-73.0PC.

SGS-ATES Componenti Elettronici SpA: *See—*
Borghese, Valerio; Erratico, Pietro; and Coccetti, Silvano, 4,417,292., Cl. 361-87.000.

Shaffer, David T.: *See—*
Gingerich, David J.; McCarty, Patrick R.; and Shaffer, David T., 4,417,106., Cl. 200-5.00R.

Shaffer, Jack C.: *See—*
Schramm, Arthur G.; and Shaffer, Jack C., 4,416,715., Cl. 156-210.000.

Shahani, Chandru T.: *See—*
Flowers, Thomas A.; Vinch, Samuel D.; and Shahani, Chandru T., 4,416,931., Cl. 428-159.000.

Shannon, Edward L., to Quaker Oats Company, The. Shelf stable pizza and method for preparing same. 4,416,904., Cl. 426-19.000.

Shapiro, Leonard, to Pennwalt Corporation. Hard surfacing for a centrifuge conveyor. 4,416,656., Cl. 494-53.000.

Sharp Kabushiki Kaisha: *See—*
Funada, Fumiaki; Matsuura, Masataka; and Wada, Tomio, 4,416,515., Cl. 350-350.00F.
Itoh, Ikuo; Anzai, Shunju; and Ohashi, Kunio, 4,416,536., Cl. 355-14.00R.
Morimoto, Masafumi; Yoshida, Kunio; and Nakanishi, Tosaku, 4,417,319., Cl. 364-900.000.

Sharpless, John, to Nordson Corporation. System for vapor precipitation and recovery in a continuous coater. 4,416,193., Cl. 98-115.0SB.

Shaw, Robert F.; and Sperinde, John, to Oximetrix, Inc. Improved optical catheter and method for making same. 4,416,285., Cl. 128-634.000.

Sheehan, Neil J.: *See—*
Norman, Melvin H.; Manske, Reinhold R.; and Sheehan, Neil J., 4,416,661., Cl. 604-86.000.

Shell Oil Company: *See—*
Graiff, L. B.; Murphy, Z. L.; and Scott, J. A. N., 4,416,669., Cl. 44-71.000.
Heinerman, Jacobus J. L.; and Post, Martin F. M., 4,417,090., Cl. 585-739.000.
Mundhenk, David L.; and Curole, Michael A., 4,416,333., Cl. 166-250.000.
Scott, Paul R., 4,416,703., Cl. 134-8.000.
Slaugh, Lynn H.; and Ryan, Robert C., 4,417,000., Cl. 518-713.000.

Shelley, Peter S.: *See—*
Hoffman, David M.; Loomis, Neil W.; Ehlert, Ralph C.; and Shelley, Peter S., 4,417,144., Cl. 250-367.000.

Shepard, Leonard F., to ILC Data Device Corporation. Microphase stepper employing improved digital timing incrementer employing a rate multiplier. 4,417,352., Cl. 377-43.000.

Sherrick, James W., to Lord Corporation. Railway vehicle laminated mount suspension. 4,416,203., Cl. 105-224.100.

Shibasoku Company Limited: *See—*
Sugihara, Kiyoyuki, 4,417,310., Cl. 364-481.000.

Shibuya, Chisei; Murakami, Masahiro; Kobayashi, Masatoru; and Sone, Takanori, to Asahi Kasei Kogyo Kabushiki Kaisha. Novel tetrazole-5-thiol ester and process for preparing cefamandole using same. 4,417,047., Cl. 544-26.000.

Shidlovsky, Igal; and Harty, William E., to RCA Corporation. High density information disc lubricants. 4,416,789., Cl. 252-34.700.

Shimadzu Corporation: *See—*
Akiyama, Junichi, 4,416,762., Cl. 204-299.00R.

Shimano Industrial Company Limited: *See—*
Noda, Hideo, 4,416,428., Cl. 242-84.21R.
Shimazaki, Keiichi: *See—*
Takenaka, Akira; Shimazaki, Keiichi; and Kuwazuru, Yasumitsu, 4,416,458., Cl. 277-96.100.
Shimazu, Teruo, to Mitsumi Electric Company, Ltd. Push-button type tuning apparatus. 4,416,164., Cl. 74-10.330.
Shimizu, Hideharu; and Hashimoto, Akihiko, to Matsushita Electric Industrial Co., Ltd. Wick for burning liquid fuel. 4,416,616., Cl. 431-325.000.
Shimizu, Ippei: *See—*
Yamato, Noboru; Hasegawa, Akira; and Shimizu, Ippei, 4,416,471., Cl. 282-27.500.
Shimizu, Yoshiaki: *See—*
Tsuda, Mitsuru; Miike, Akira; Shimizu, Yoshiaki; Yokote, Yasuharu; and Tatano, Toshio, 4,416,982., Cl. 435-11.000.
Shimma, Yashiro: *See—*
Nakada, Minoru; Shimma, Yashiro; Inoue, Osamu; and Suma, Sei, 4,416,327., Cl. 165-122.000.
Shimoda, Mituhiko: *See—*
Iomori, Yasumasa; and Shimoda, Mituhiko, 4,416,526., Cl. 354-198.000.
Shimp, David A., to Celanese Corporation. Polyol/imidazole curing agents for epoxy resins. 4,417,010., Cl. 523-466.000.
Shin-Etsu Polymer Co., Ltd.: *See—*
Sado, Ryoichi; and Tahara, Kazutoki, 4,416,498., Cl. 339-60.00R.
Shinal, Edward C.: *See—*
Kaplan, Murray A.; and Shinal, Edward C., 4,416,874., Cl. 424-177.000.
Shinkawa, Keiro; Matsuura, Shigeo; Sodeyama, Chuichi; Noda, Masaki; and Kondo, Masakazu, to Hitachi, Ltd. FM Television signal receiving circuit. 4,417,279., Cl. 358-195.100.
Shinozaki, Takashi: *See—*
Inoue, Yuzuru; Shinozaki, Takashi; Otake, Yoshichi; and Ono, Shinsuke, 4,417,272., Cl. 358-44.000.
Shiota, Ikuo: *See—*
Nishizawa, Jun-ichi; and Shiota, Ikuo, 4,416,952., Cl. 428-698.000.
Shiozaki, Makoto; Haseda, Satoshi; Tarui, Jun; Ito, Osamu; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Kawai, Shizuo; and Sami, Hiroshi, to Nippondenso Co., Ltd. Electrical fuel injection pump governor. 4,416,232., Cl. 123-357.000.
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, to Canon Kabushiki Kaisha. Electrophotographic member having aluminum oxide layer. 4,416,962., Cl. 430-65.000.
Shirayama, Akira: *See—*
Haga, Yukio; Kai, Tomeo; Shirayama, Akira; and Kanatani, Gengi, 4,416,580., Cl. 414-626.000.
Shishikura, Masami: *See—*
Ishii, Hirohisa; Shishikura, Masami; and Okamura, Toshihiko, 4,417,167., Cl. 310-67.00R.
Shoemaker, William A., Jr.: *See—*
Nestor, Jack; and Shoemaker, William A., Jr., 4,416,063., Cl. 33-163.000.
Shores, William M.: *See—*
Harshbarger, John H.; and Shores, William M., 4,417,275., Cl. 358-139.000.
Shtengel, Eduard G.: *See—*
Gelfand, Yakov E.; Komova, Marina L.; Shtengel, Eduard G.; and Yakovis, Leonid M., 4,416,394., Cl. 222-55.000.
Shutt, Joseph A.; Tutt, Kingsley J.; Tillyard, Malcolm; and Brown, Terence J., to USM Corporation. Machine adapted for use in the manufacturing of shoes. 4,416,031., Cl. 12-127.000.
Shy, James L.: *See—*
Zagar, Steven J.; and Shy, James L., 4,416,696., Cl. 106-100.000.
Zagar, Steven J.; and Shy, James L., 4,416,697., Cl. 106-100.000.
Sid Harvey, Inc.: *See—*
Lindtveit, Herbert E., 4,416,592., Cl. 417-290.000.
Siedel, Joachim: *See—*
Roder, Albert; Siedel, Joachim; Mollering, Hans; Seidel, Hans; and Gauhl, Helmgard, 4,416,983., Cl. 435-25.000.
Siemens Aktiengesellschaft: *See—*
Ghosh, Shyamal-Krishna, 4,417,192., Cl. 318-797.000.
Kueenzle, Paul; Krysiak, Juergen; and Reuter, Hans-Karl, 4,417,112., Cl. 200-146.00R.
Pfeiler, Manfred, 4,417,354., Cl. 378-19.000.
Scherer, Hartmut; and Thilo, Peer, 4,416,067., Cl. 33-356.000.
Schmidt, Helmut, 4,417,191., Cl. 318-760.000.
Schmitmann, Herbert, 4,417,171., Cl. 313-16.000.
Siemens Gammasonics, Inc.: *See—*
Haas, Werner J.; and Scribano, Frank C., 4,417,143., Cl. 250-363.00S.
Siemund, Gunter; and Oei, Han Y., to Occidental Chemical Corporation. Composition and process for production of phosphate coatings on metal surfaces. 4,416,705., Cl. 148-6.15Z.
Signode Corporation: *See—*
Scheffers, Richard W.; and Boeckmann, Hugo, 4,416,376., Cl. 206-554.000.
Silberberg, George G.: *See—*
Keller, Patrick N.; Franck, Jerome B.; and Silberberg, George G., 4,417,123., Cl. 219-121.0LH.
Silbernagel, Raymond A.: *See—*
Humphrey, John W.; and Silbernagel, Raymond A., 4,416,059., Cl. 29-751.000.
Silvey, Elmer R. Automatic saw chain grinder. 4,416,169., Cl. 76-25.00A.
Sima Products Corporation: *See—*
Breslau, Steven M.; and Grossman, M. Gary, 4,416,528., Cl. 354-296.000.
Simplicity Manufacturing, Inc.: *See—*
Slazas, John J., 4,416,109., Cl. 56-209.000.
Simpson, Barbara E.; and Gervais, Norman A., to Eli Lilly and Company. Sustained release capsule for ruminants. 4,416,659., Cl. 604-48.000.
Simpson, Daniel W.: *See—*
Davis, Stephen H.; and Simpson, Daniel W., 4,416,773., Cl. 210-289.000.
Simpson, David P., to Electricity Council, The. Apparatus for heating electrically conductive flowable media. 4,417,132., Cl. 219-291.000.
Simpson, Robert A.: *See—*
Pfeiffer, Hans C.; Simpson, Robert A.; and Stickel, Werner, 4,417,203., Cl. 324-51.000.
Simson, Anton K.: *See—*
Tanner, Curtis J.; Bender, Richard E.; Simson, Anton K.; and McCutchen, Hugh, Jr., 4,416,329., Cl. 166-68.000.
Sinclair, Brett J. Non-mechanical electromagnetic scanning device. 4,416,512., Cl. 350-171.000.
Sinek, Joachim R., to Kennecott Corp. Induced draft cooling tower. 4,416,836., Cl. 261-112.000.
Singer Company, The: *See—*
Jacks, Herbert G., 4,417,253., Cl. 346-17.000.
McKenna, Joseph V., 4,417,234., Cl. 340-347.0AD.
Singer, Hans S. Yarn tensioning device. 4,416,431., Cl. 242-151.000.
Singletary, B. Huston. System for automatically aligning a support roller system under a rotating body. 4,416,492., Cl. 308-203.000.
Singletary, Glennwood: *See—*
Baker, Royce E.; and Singletary, Glennwood, 4,416,339., Cl. 175-61.000.
Sinka, Joseph V.; and LieBerman, Robert A., to Diamond Shamrock Corporation. Polysiloxane stabilizers for flatting agents in radiation hardenable compositions. 4,417,023., Cl. 524-731.000.
Sjostedt, Bertil; Carlsson, Gunnar; and Lindholm, Hans, to Elektro Standard AB. Device for the recovery of heat. 4,416,121., Cl. 62-238.600.
Skala, Stephen F. Fluid drive for an orifice band ink jet printer. 4,417,252., Cl. 346-1.100.
Skarp, Jarmo I.: *See—*
Antson, Jorma O.; Lindfors, Sven G.; Pakkala, Arto J.; Skarp, Jarmo I.; Suntola, Tuomo S.; and Ylilammi, Markku A., 4,416,933., Cl. 428-216.000.
Skinner, Heather B.: *See—*
Tuck, Richard A.; and Skinner, Heather B., 4,417,173., Cl. 313-366.00R.
Skogstrom, Lars; and Bergqvist, Bengt, to Aeromator Trading Company AB. Method and arrangement for heat conditioning of buildings. 4,416,259., Cl. 126-429.000.
Skotheim, Terje. Photoelectrochemical cells for conversion of solar energy to electricity. 4,416,959., Cl. 429-111.000.
SKW Trostberg Aktiengesellschaft: *See—*
Goll, Werner, 4,416,925., Cl. 427-393.500.
Slaugh, Lynn H.; and Ryan, Robert C., to Shell Oil Company. Dimethyl ether process. 4,417,000., Cl. 518-713.000.
Slazas, John J., to Simplicity Manufacturing, Inc. Mower attachment draft linkage responding to ground contour. 4,416,109., Cl. 56-209.000.
Sleeper & Hartley Corp.: *See—*
Russell, Frank S., 4,416,135., Cl. 72-130.000.
Slocum, Chester D., to Cordis Corporation. Programming and telemetry system for biomedical implantable device. 4,416,283., Cl. 128-419.0PG.
Smith, Clive P.: *See—*
Cogswell, Frederic N.; Griffin, Brian P.; and Smith, Clive P., 4,417,043., Cl. 528-176.000.
Smith, Daniel D., to Minnesota Mining & Manufacturing Company. Dispenser for adhesive coated sheet material. 4,416,392., Cl. 221-45.000.
Smith, Dean L., Jr.: *See—*
Merchant, Philip, Jr.; and Smith, Dean L., Jr., 4,416,754., Cl. 204-190.000.
Smith, Graham M., to Merck & Co., Inc. Molecular models. 4,416,635., Cl. 434-280.000.
Smith International, Inc.: *See—*
Bailey, Edmond I., 4,416,340., Cl. 175-195.000.
Fowler, John H.; and Gruller, David L., 4,416,472., Cl. 285-3.000.
Pribbenow, Walter A., 4,416,554., Cl. 384-95.000.
Smith, Kent F. Dynamically operated structured logic array. 4,417,327., Cl. 365-203.000.
Smith, Michael C. Multi-purpose mechanic's glove. 4,416,026., Cl. 2-161.00R.
Smith, Roderick A.: *See—*
Chaplin, George B. B.; Powell, Andrew R.; and Smith, Roderick A., 4,417,098., Cl. 381-94.000.
Smith, Rush B.; and Daloisio, Pasquale C., to Pennsylvania Pacific Corporation. Nest and stack container. 4,416,374., Cl. 206-507.000.
Smith, Thomas M. Gas-fired infra-red generators and use thereof. 4,416,618., Cl. 431-328.000.
Snap-on Tools Corporation: *See—*
Ciriacks, Patrick E.; and Gibson, Gary S., 4,417,211., Cl. 324-392.000.
Nelson, James W.; Zuzinec, Raymond R.; and Foster, Michael L., 4,416,338., Cl. 173-134.000.

Snead, Edwin D. Apparatus and method for weighing rolling railcars. 4,416,342., Cl. 177-163.000.
Snitman, David L.: *See*—
Nakane, Masami; Snitman, David L.; Reid, Joyce; and Haslanger, Martin F., 4,416,896., Cl. 424-285.000.
Snyder, Paul J.: *See*—
Favin, David L.; Lynn, Peter F.; and Snyder, Paul J., 4,417,337., Cl. 371-22.000.
Sochor, Jerzy R. Contact with dual cantilevered arms with narrowed, complimentary tip portions. 4,416,504., Cl. 339-252.00P.
Societa Cavi Pirelli S.p.A.: *See*—
Occhini, Elio; Lanfranconi, Gianmario; and Metra, Piero, 4,417,093., Cl. 174-25.00R.
Societa' Pneumatici Pirelli S.p.A.: *See*—
Caretta, Renato, 4,416,317., Cl. 152-209.00R.
Societe Anonyme dite: L'Oreal: *See*—
Vanlerberghe, Guy; and Sebag, Henri, 4,416,868., Cl. 424-59.000.
Societe Chimique des Charbonnages-CdF Chimie: *See*—
Kepes, Andre; Weynant, Eric; Avenas, Pierre; and Haudin, Jean-Marc, 4,417,041., Cl. 526-348.600.
Societe Chimique des Charbonnages—CdF Chimie: *See*—
Durand, Pierre; Charlon, Pierre; and Jouffroy, Guy, 4,416,856., Cl. 422-131.000.
Societe Lorraine de Laminage Continu: *See*—
Helfi, Alfred F.; and Muller, Jean-Claude H., 4,416,443., Cl. 266-47.000.
Societe Nationale Industrielle Aerospatiale: *See*—
Thibert, Jean-Jacques; Rodde, Anne-Marie; and Pouradier, Jean-Marc E., 4,416,434., Cl. 244-35.00R.
Sodeyama, Chuichi: *See*—
Shinkawa, Keiro; Matsuura, Shigeo; Sodeyama, Chuichi; Noda, Masaki; and Kondo, Masakazu, 4,417,279., Cl. 358-195.100.
Solc, Jitka; and Haigh, Daniel H., to Dow Chemical Company, The. Magnetic imbiber polymers and method for the preparation thereof. 4,416,945., Cl. 428-407.000.
Solloway, Daniel S. Aquatic exercise assembly. 4,416,451., Cl. 272-116.000.
Solvay & Cie.: *See*—
Gabellieri, Rodolfo; and Bouteille, Rene, 4,416,949., Cl. 428-461.000.
Solvi, Marc: *See*—
Kirchen, Michel; Solvi, Marc; and Burton, Clement, 4,416,673., Cl. 55-267.000.
Solymos, Andras: *See*—
Szebenyi, Ferenc; Nemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, 4,416,566., Cl. 405-291.000.
Somfy: *See*—
Bullat, Jean, 4,417,185., Cl. 318-2.000.
Sone, Takanori: *See*—
Shibuya, Chisei; Murakami, Masahiro; Kobayashi, Masateru; and Sone, Takanori, 4,417,047., Cl. 544-26.000.
Sonelt Corporation: *See*—
Leale, Luis, 4,417,181., Cl. 315-209.00R.
Sonnabend, Ferdinand: *See*—
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,416,409., Cl. 228-173.00R.
Sonoco Products Company: *See*—
Yon, William S., 4,416,200., Cl. 101-228.000.
Sony Corporation: *See*—
Hoshimi, Susumu; and Kojima, Tadashi, 4,417,283., Cl. 358-310.000.
Ichigaya, Hiroshi, 4,416,180., Cl. 84-1.230.
Ishii, Hirohisa; Shishikura, Masami; and Okamura, Toshihiko, 4,417,167., Cl. 310-67.00R.
Sato, Ichitaro, 4,417,284., Cl. 358-316.000.
Sopira, Michael M.: *See*—
Thomas, Richard N.; and Sopira, Michael M., 4,416,054., Cl. 29-572.000.
Sorenson, Richard W., to Carlingswitch, Inc. Switch construction. 4,417,109., Cl. 200-68.000.
Soula, Gerard; and Balme, Maurice, to Rhone-Poulenc Specialties Chimiques. N-alkylation of organonitrogen compounds. 4,417,048., Cl. 544-38.000.
Soula, Gerard, to Rhone-Poulenc Specialites Chimiques. Selective 2-chlorination of meta-dihalobenzenes. 4,417,081., Cl. 570-147.000.
Sound Attenuators Limited: *See*—
Chaplin, George B. B.; Powell, Andrew R.; and Smith, Roderick A., 4,417,098., Cl. 381-94.000.
Source Technologies Corporation: *See*—
Kramer, Milo G., 4,416,520., Cl. 353-101.000.
Southern Gas Association: *See*—
Edlund, Carl E., 4,417,164., Cl. 307-497.000.
Southwest Research Institute: *See*—
Wood, Charles D., 4,416,229., Cl. 123-304.000.
Sovey, James S.: *See*—
Curren, Arthur N.; Forman, Ralph; Sovey, James S.; and Wintucky, Edwin G., 4,417,175., Cl. 315-5.380.
Specht, Glenn E., to Hoover Company, The. Full bag indicator. 4,416,033., Cl. 15-339.000.
Spencer, Edward M., to Brown Boveri Electric Inc. Underwater gas-insulated cable with plural internal pressures. 4,417,094., Cl. 174-28.000.
Speno International S.A.: *See*—
Panetti, Romolo, 4,416,091., Cl. 51-178.000.
Sperinde, John: *See*—
Shaw, Robert F.; and Sperinde, John, 4,416,285., Cl. 128-634.000.
Sperry Corporation: *See*—
Brandsness, Gordon T.; Ebright, Robert L.; and Orosz, Alexander J., 4,416,497., Cl. 339-17.00F.
Chen, Tsu F.; and Gottschalk, Juan M., 4,416,144., Cl. 73-12.000.
Zscheile, John W., Jr., 4,417,249., Cl. 343-379.000.
Sperry, Paul A.: *See*—
Bialobrzeski, Walter; and Sperry, Paul A., 4,416,477., Cl. 292-19.000.
Spinosa, Dominic J.; and Knoll, Frank, to East/West Industries, Inc. Anti-exposure jacket. 4,416,641., Cl. 441-94.000.
Spirig, Ernst. Solder removing device. 4,416,408., Cl. 228-19.000.
Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie): *See*—
van Wijngaarden, Hans, 4,416,450., Cl. 271-303.000.
Staats, Charles W., to Bradford-White Corportion. Hot water heater circuitry. 4,416,222., Cl. 122-13.00R.
Stab, Rudolf: *See*—
Fischer, Rudolf; and Stab, Rudolf, 4,416,652., Cl. 493-399.000.
Stacey, Ralph C., to Tarrant Manufacturing Company. Flexible coupling. 4,416,475., Cl. 285-229.000.
Stacy, Artis J. Clutch drive differential. 4,416,167., Cl. 74-650.000.
Stamicarbon B.V.: *See*—
Corvers, Antonius; van den Broek, Cornelis W.; and Suverkropp, Geertrudes H., 4,417,053., Cl. 546-315.000.
Standard Duplicating Machines Corp.: *See*—
Bergman, Carl A.; Thomas, Roy L.; and Bourbeau, Richard A., 4,416,722., Cl. 156-578.000.
Standard Oil Company (Indiana): *See*—
Lee, Richard J.; Kurasiewicz, Adam S.; and Richardson, Eugene E., 4,416,829., Cl. 260-927.00R.
Nimry, Tayseer S.; and Fields, Ellis K., 4,417,045., Cl. 528-188.000.
Udovich, Carl A.; and Edwards, Robert C., 4,416,802., Cl. 502-209.000.
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Staten, Harold D., to Donaldson, Helen; Donaldson, Melody J.; and Decker, Tracey Donaldson. Snap ring removal tool. 4,416,045., Cl. 29-229.000.
Stauffer Chemical Company: *See*—
Green, Laddie L., 4,416,685., Cl. 71-95.000.
Thiele, Gerald H., 4,416,684., Cl. 71-95.000.
STD Filter Company, Inc.: *See*—
Halbich, Frank; and Greene, Jeffrey L., 4,416,775., Cl. 210-236.000.
Steck, Edgar A.: *See*—
Alving, Carl R.; and Steck, Edgar A., 4,416,872., Cl. 424-177.000.
Steckmann, Helmut: *See*—
Fleischmann, Heinz; and Steckmann, Helmut, 4,417,152., Cl. 307-64.000.
Steinbrink, Wilfried, to C. Ed. Schulte GmbH. Cylinder lock. 4,416,128., Cl. 70-364.00A.
Steinhilber, Helmut. Apparatus, mountable on an office machine, for feeding single sheets from a paper stack stored in a magazine. 4,416,559., Cl. 400-629.000.
Stelte, David J.: *See*—
Kelly, Michael J.; Lindsay, Robert L.; Kobylar, Alex W.; and Stelte, David J., 4,417,335., Cl. 370-110.100.
Stendel, Wilhelm: *See*—
Kruger, Bernd-Wieland; Riebel, Hans-Jochem; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, 4,416,832., Cl. 260-940.000.
Stenz, Paul, to C. A. Weidmuller GmbH & Co. Screwless electrical terminal. 4,416,500., Cl. 339-95.00D.
Steri-Pac, Inc.: *See*—
Hall, Robert M., 4,416,663., Cl. 604-163.000.
Sterling Drug Inc.: *See*—
Gelotte, Karl O., 4,417,054., Cl. 546-340.000.
Schmidt, Paul J.; and Hung, William M., 4,417,059., Cl. 548-456.000.
Zenith, Bernard L., 4,417,052., Cl. 546-246.000.
Sterman, Albert P., deceased: *See*—
Lenahan, Dean T.; Corsmeier, Robert J.; and Sterman, Albert P., deceased, 4,416,111., Cl. 60-39.290.
Sterman, Florence G., executor: *See*—
Lenahan, Dean T.; Corsmeier, Robert J.; and Sterman, Albert P., deceased, 4,416,111., Cl. 60-39.290.
Stern, Theodore G., to General Dynamics, Convair Division. Method of making a thin-film solar cell. 4,416,052., Cl. 29-572.000.
Stetter, Jorg; Lunkenheimer, Winfried; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Combating fungi with N-allenyl-acetanilides. 4,416,889., Cl. 424-269.000.
Stevens, R. D. Samuel, to Concord Scientific Corporation. Process for reduction of the content of SO_2 and/or NO_x in flue gas. 4,416,748., Cl. 204-157.10P.
Stevenson, John; Machin, John; and Dyke, David L., to Foseco International Limited. Sand reclamation. 4,416,694., Cl. 106-84.000.
Stickel, Werner: *See*—
Pfeiffer, Hans C.; Simpson, Robert A.; and Stickel, Werner, 4,417,203., Cl. 324-51.000.
Stock, Mark E.: *See*—
Salkeld, Stephen A.; and Stock, Mark E., 4,416,093., Cl. 52-71.000.
Stockman, Richard F.; and Macler, Paul L., to Air Preheater Company, Inc., The. Cast recuperator tube. 4,416,044., Cl. 29-157.30R.

Stoddart, James O.: *See—*
Austin, Lowell W.; and Stoddart, James O., 4,416,737., Cl. 204-28.000.

Stoehr, Richard T.: *See—*
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Stogryn, Eugene L., to Exxon Research and Engineering Co. Di-(Secondary and tertiaryalkylaminoalkoxy)alkanes. 4,417,075., Cl. 564-505.000.

Stokes, Ronald E., to Xerox Corporation. Method of binding sheets using stitchers. 4,416,046., Cl. 29-417.000.

Stork Brabant B.V.: *See—*
van de Steeg, Antonius T. H.; and van Mondfrans, Gerardus H., 4,416,704., Cl. 134-34.000.

Stork, Sven, to Electrolux Siegen GmbH. Vending machine with separate interlocking sections. 4,416,363., Cl. 194-4.00D.

Storni, Angelo: *See—*
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,417,058., Cl. 548-451.000.

Stoss, Peter, to Heinrich Mack Nachf. Chem.-Pharmazeutische Fabrik. Process for the preparation of isosorbide 2-nitrate. 4,417,065., Cl. 549-464.000.

Stover, William A.: *See—*
Chester, Arthur W.; Cormier, William E., Jr.; and Stover, William A., 4,416,765., Cl. 208-120.000.

Stowe, Gerald T.: *See—*
Reimer, Ronald A.; and Stowe, Gerald T., 4,416,824., Cl. 260-439.00R.

Stowers, Jeffrey P., to Virginia Panel Corporation. Electrical contact probe and method of manufacturing. 4,417,206., Cl. 324-158.00P.

Strand, Mette, to Johns Hopkins University, The. Diagnosis and treatment of fluke infections with monoclonal antibodies. 4,416,866., Cl. 424-1.100.

Strange, Donald R.: *See—*
Bennett, Matthew C.; and Strange, Donald R., 4,417,276., Cl. 358-160.000.

Straubel, Max, to Robert Bosch GmbH. Control apparatus for internal combustion engines. 4,416,233., Cl. 123-383.000.

Strobel, Charles. Marine animal trap. 4,416,082., Cl. 43-102.000.

Struck, Carl-Heinz: *See—*
Gernhardt, Paul; Thubeauville, Heinz; and Struck, Carl-Heinz, 4,416,732., Cl. 202-139.000.

Stuckert, Paul E., to International Business Machines Corporation. Air jet powered cooling system for electronic assemblies. 4,417,295., Cl. 361-384.000.

Stuckey, Buddy S.: *See—*
Henry, John J., Sr.; and Stuckey, Buddy S., 4,416,058., Cl. 29-734.000.

Stucki, Samuel: *See—*
Menth, Anton; and Stucki, Samuel, 4,416,747., Cl. 204-129.000.

Studer, Urs P., to Zumbach Electronic AG. Process and device for the measurement of a physical quantity of an extruded element. 4,416,541., Cl. 356-386.000.

Stuhler, Rolf: *See—*
Berghammer, Conrad; Schafer, Walter; and Stuhler, Rolf, 4,416,298., Cl. 132-33.00R.

Stutzel, Klaus: *See—*
Knorre, Helmut; Fischer, Joachim; and Stutzel, Klaus, 4,416,786., Cl. 210-746.000.

Stytsenko, Valentin D.: *See—*
Rozovsky, Alexandr Y.; Stytsenko, Valentin D.; Nizova, Svetlana A.; Belov, Petr S.; and Dyakonov, Alexandr J., 4,417,076., Cl. 568-361.000.

Subramanian, Pallatheri M.: *See—*
Mahr, Tibor G.; and Subramanian, Pallatheri M., 4,416,749., Cl. 204-159.140.

Sudan, Krishan K.; and Berchem, Antoine, to Reichhold Limited. Phenol formaldehyde foams. 4,417,004., Cl. 521-181.000.

Sudhalter, Marvin: *See—*
Klein, George; Manber, Solomon; Sudhalter, Marvin; and Taylor, Alvin, 4,417,151., Cl. 307-24.000.

Sugano, Junichiro; Kobayashi, Shuichi; Yui, Tomoyuki; Fujimoto, Tsuneo; and Kubota, Minoru, to Mitsubishi Gas Chemical Company, Inc. Apparatus for granulating sodium percarbonate. 4,416,606., Cl. 425-202.000.

Sugawara, Mituo: *See—*
Hiromi, Fukuoka; Matsuo, Masataka; Hamai, Kazuo; Hatta, Tokuaki; and Sugawara, Mituo, 4,416,999., Cl. 501-94.000.

Sugerman, Gerald; and Monte, Salvatore J., to Kenrich Petrochemicals, Inc. Pyrophosphato titanate adducts. 4,417,009., Cl. 523-451.000.

Sugihara, Kiyoyuki, to Shibasoku Company Limited. Apparatus for measuring distortion factor. 4,417,310., Cl. 364-481.000.

Sugimoto, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for detecting torque in electric dynamometer. 4,416,160., Cl. 73-862.170.

Sugitani, Hiroshi, to Canon Kabushiki Kaisha. Ink jet head. 4,417,251., Cl. 346-1.100.

Sugitani, Yuji: *See—*
Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, 4,417,128., Cl. 219-125.120.

Sugiura, Hiroyuki: *See—*
Sutoh, Shinji; Hara Toshizo; Sugiura, Hiroyuki; and Kojima, Toshio, 4,416,324., Cl. 165-12.000.

Sugiyama, Kazuo, to Matsuda, Shigeo. Discharging element energizing circuit for discharge-type fire alarm sensor unit. 4,417,217., Cl. 331-66.000.

Sugo, Yasuhisa: *See—*
Toyoda, Kazuhiro; and Sugo, Yasuhisa, 4,417,326., Cl. 365-190.000.

Sullivan, Frank E.: *See—*
Bettner, Timothy J.; Sullivan, Frank E.; and Hartley, Croydon R., 4,416,175., Cl. 83-29.000.

Sullivan, John; and Lillibridge, Harold R., to Champion International Corporation. Envelope gummer cylinder clutch and brake. 4,416,651., Cl. 493-12.000.

Sullivan, Leroy J., to Chartered Industries of Singapore Private Limited. Sear buffer. 4,416,186., Cl. 89-198.000.

Suma, Sei: *See—*
Nakada, Minoru; Shimma, Yashiro; Inoue, Osamu; and Suma, Sei, 4,416,327., Cl. 165-122.000.

Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See—*
Hayashi, Chihiro, 4,416,134., Cl. 72-68.000.

Sumner, Gary D. Wall mounted display case for stuffed animals. 4,416,493., Cl. 312-245.000.

Sun-Ohio, Inc.: *See—*
Jordan, Otis D., 4,416,767., Cl. 208-262.000.

Sun Powered Inc.: *See—*
Secamiglio, John J.; Secamiglio, Edward T.; and Secamiglio, Anthony J., 4,416,255., Cl. 126-422.000.

Sundberg, Carl W., Jr.: *See—*
Commette, Denis S.; and Sundberg, Carl W., Jr., 4,416,305., Cl. 137-614.000.

Sunds Defibrator Aktiebolag: *See—*
Carre, Olof G.; Josefsson, Paul W.; Nasman, Lars E.; and Zetterqvist, Stig B. H., 4,416,548., Cl. 366-168.000.

Sung, Rodney L.: *See—*
Kaufman, Benjamin J.; Sung, Rodney L.; and Sweeney, William M., 4,416,667., Cl. 44-56.000.

Suntola, Tuomo S.: *See—*
Antson, Jorma O.; Lindfors, Sven G.; Pakkala, Arto J.; Skarp, Jarmo I.; Suntola, Tuomo S.; and Ylilammi, Markku A., 4,416,933., Cl. 428-216.000.

Suroff, Leonard W.: *See—*
Kolt, Stanley, 4,416,415., Cl. 236-49.000.

Susumu, Hanyu, to Janome Sewing Machine Industry Co., Ltd. Method for stitching ornamental letters by sewing machine. 4,416,209., Cl. 112-266.100.

Sutoh, Shinji; Hara Toshizo; Sugiura, Hiroyuki; and Kojima, Toshio, to Diesel Kiki Company, Ltd. Vehicle temperature control apparatus. 4,416,324., Cl. 165-12.000.

Suverkropp, Geertrudes H.: *See—*
Corvers, Antonius; van den Broek, Cornelis W.; and Suverkropp, Geertrudes H., 4,417,053., Cl. 546-315.000.

Suzuki, Hitoshi: *See—*
Morozumi, Takuro; and Suzuki, Hitoshi, 4,416,236., Cl. 123-438.000.

Suzuki, Kiyohisa; Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; Ban, Hiroshi; and Ishida, Nobuyasu, to Aisin Seiki Co., Ltd. Friction facings reinforced with stitching. 4,416,361., Cl. 192-107.00M.

Suzuki, Ryo: *See—*
Asano, Atsushi; Takeshita, Masatoshi; Nishida, Hideki; Suzuki, Ryo; and Futami, Toshio, 4,417,323., Cl. 365-1.000.

Suzuki, Takami: *See—*
Iwata, Nobuo; Matsuhisa, Koh; Takada, Hiromi; and Suzuki, Takami, 4,416,556., Cl. 400-144.200.

Suzuki, Yasuo: *See—*
Nomura, Hirokazu; Sugitani, Yuji; and Suzuki, Yasuo, 4,417,128., Cl. 219-125.120.

Suzumura, Takeshi: *See—*
Saito, Shozo; and Suzumura, Takeshi, 4,416,847., Cl. 376-253.000.

Svoboda, Glenn R.; Carlstrom, William L.; and Stoehr, Richard T., to Freeman Chemical Corporation. Low smoke isocyanurate modified urethane foam and method of making same. 4,417,001., Cl. 521-114.000.

Swanberg, Robert H., to Union Camp Corporation. Controlled access package. 4,416,377., Cl. 206-602.000.

Swartwout, Everett W. Bottle cap with integral measuring cup and bottle closure. 4,416,381., Cl. 215-228.000.

Swaziek, Laurence J.: *See—*
Kilts, Harold J.; and Swaziek, Laurence J., 4,416,362., Cl. 193-25.00C.

Sweeney, William M.: *See—*
Kaufman, Benjamin J.; Sung, Rodney L.; and Sweeney, William M., 4,416,667., Cl. 44-56.000.

Swift, Wayne M.: *See—*
Foster, Karl; Rauch, Gary C.; Swift, Wayne M.; and Thornburg, Donald R., 4,416,707., Cl. 148-111.000.

Swiss Aluminium Ltd.: *See—*
Haggenmacher, Thomas; Gut, Edwin; Friedli, Hans; and Maugweiler, Gottfried, 4,416,489., Cl. 299-94.000.

Symphar S.A.: *See—*
Bentzen, Craig L.; Mong, Lan N.; and Niesor, Eric, 4,416,877., Cl. 424-204.000.

Szabo nee Mogyorosi, Katalin: *See—*
Gencev, Dinko; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; and Szepvolgyi, Janos, 4,416,862., Cl. 423-335.000.

Szala, Lawrence E.: *See—*
Lee, Minyoung; and Szala, Lawrence E., 4,416,840., Cl. 264-60.000.

Szebenyi, Ferenc; Nemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, to Tatabanyai Szenbanyak. Supporting apparatus for the protection of mine gate crossings. 4,416,566., Cl. 405-291.000.

Szendrodi, Valer; and Gyurics, Karoly, to Ikarus Karosszeria es Jarmugyar. Baggage-handling system for airports. 4,416,435., Cl. 244-114.00R.

Szepvolgyi, Janos: *See*—
Gencev, Dinko; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; and Szepvolgyi, Janos, 4,416,862., Cl. 423-335.000.

Szysh, John A. Guide structure for trolley rail and flying pickup. 4,416,357., Cl. 191-23.00A.

Tabasky, Marvin: *See*—
McCarthy, Jeremiah P.; and Tabasky, Marvin, 4,416,055., Cl. 29-577.00C.

Tabata, Hiromaro, to Miki Corporation. Cigarette lighter. 4,416,612., Cl. 431-131.000.

Tabusa, Fujio: *See*—
Ishikawa, Hiroshi; Tabusa, Fujio; and Nakagawa, Kazuyuki, 4,416,884., Cl. 424-250.000.

Tachibana, Eiichi; and Hikosaka, Shinichi, to Dai Nippon Insatsu Kabushiki Kaisha. Apparatus for fabricating gravure printing cylinders with synthetic resin surface. 4,416,215., Cl. 118-642.000.

Tachiuchi, Tsuguji: *See*—
Hirahata, Shigeru; Takezawa, Teruhiro; Onuki, Nobuo; Komatsu, Shigeru; and Tachiuchi, Tsuguji, 4,417,318., Cl. 364-900.000.

Tackles, George J.: *See*—
Jannard, James H.; and Tackles, George J., 4,416,166., Cl. 74-551.900.

Taft, Darwin O.; and Van Siclen, Howard E., Jr., to Bendix Corporation, The. Apparatus for distributing electrical signals. 4,416,245., Cl. 123-613.000.

Tahara, Kazutoki: *See*—
Sado, Ryoichi; and Tahara, Kazutoki, 4,416,498., Cl. 339-60.00R.

Taiho Kogyo Kabushiki Kaisha: *See*—
Takenaka, Akira; Shimazaki, Keiichi; and Kuwazuru, Yasumitsu, 4,416,458., Cl. 277-96.100.

Takada, Hiromi: *See*—
Iwata, Nobuo; Matsuhisa, Koh; Takada, Hiromi; and Suzuki, Takami, 4,416,556., Cl. 400-144.200.

Takahashi, Akira: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,416,432., Cl. 242-199.000.

Takahashi, Jiro; Komamura, Tawara; and Kobayashi, Ryuichiro, to Konishiroku Photo Industry Co., Ltd. Photographic light-sensitive elemcnt with nitrophyenylazo metal complexable dye. 4,416,979., Cl. 430-562.000.

Takahashi, Susumu, to Kanto Yakin Kogyo Kabushiki Kaisha. Muffle furnace. 4,416,623., Cl. 432-36.000.

Takahashi, Takeshi: *See*—
Kishi, Tuneo; Takeda, Yasuhide; Tsubaki, Toru; and Takahashi, Takeshi, 4,417,111., Cl. 200-148.00R.

Takahashi, Toshio: *See*—
Nagao, Susumu; Kurabayashi, Katsuhiko; Futamura, Nobuyuki; Kinoshita, Hidefumi; and Takahashi, Toshio, 4,416,819., Cl. 260-293.30B.

Takahashi, Tsunehiko: *See*—
Takeuchi, Hideaki; Takahashi, Tsunehiko; and Noguchi, Masaru, 4,417,149., Cl. 250-563.000.

Takahashi, Yoshio, to Fujitsu Limited. Process for preparation of film coils. 4,416,056., Cl. 29-603.000.

Takakuwa, Yasuo: *See*—
Arai, Kazutaka; Ohara, Yoshio; Takakuwa, Yasuo; and Iizumi, Toyoko, 4,417,070., Cl. 560-56.000.

Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Tanaka, Kazutoshi, to NGK Spark Plug Co., Ltd. Gas component detector. 4,417,228., Cl. 338-34.000.

Takamura, Yoshio: *See*—
Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,417,153., Cl. 307-140.000.

Takaoka, Michio: *See*—
Hasegawa, Masakazu; Takaoka, Michio; Oshima, Hiroto; and Kataoka, Keiichiro, 4,416,601., Cl. 425-68.000.

Takaoka, Takashi; Mochizuki, Masahiko; Yamashita, Mitsuo; and Miura, Tadao, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing an optical disc. 4,417,331., Cl. 369-111.000.

Takase, Sadao; and Hosaka, Akio, to Nissan Motor Company, Limited. Electronic control system for an internal combustion engine with correction means for correcting value determined by the control system with reference to atmospheric air pressure. 4,416,239., Cl. 123-478.000.

Takashima, Toshiharu: *See*—
Yamakage, Tetsuro; and Takashima, Toshiharu, 4,416,569., Cl. 408-4.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, 4,416,879., Cl. 424-246.000.

Takasugi, Sumio: *See*—
Tokieda, Akinori; and Takasugi, Sumio, 4,417,005., Cl. 523-351.000.

Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,416,879., Cl. 424-246.000.

Takayama, Keiichi: *See*—
Hiroshima, Soichi; Hirasawa, Hidenao; Nakasai, Yoshinori; and Takayama, Keiichi, 4,416,442., Cl. 266-44.000.

Takayama, Syuichi, to Olympus Optical Co., Ltd. Light source device for an endoscope. 4,416,524., Cl. 354-31.000.

Takayama, Yoshihisa: *See*—
Ito, Akihiko; Tanaka, Hisami; Takayama, Yoshihisa; and Kato, Seiji, 4,417,158., Cl. 307-269.000.

Take, Shigeo: *See*—
Aoki, Susumu; Asaumi, Hiroshi; Take, Shigeo; and Akase, Masazumi, 4,416,043., Cl. 29-132.000.

Takeda, Atsushi: *See*—
Koda, Yoshinobu; Ona, Isao; and Takeda, Atsushi, 4,417,024., Cl. 524-861.000.

Takeda Chemical Industries, Ltd.: *See*—
Fukuda, Tsunehiko; Kobayashi, Shigeru; and Fujino, Masahiko, 4,416,820., Cl. 548-496.000.
Matsuo, Taisuke; and Ochiai, Michihiko, 4,416,817., Cl. 260-239.00A.

Takeda, Minoru; Nitta, Toshimi; and Saito, Hitoshi, to Hokkai Can Co., Ltd. Closure arrangement for easy open type container. 4,416,390., Cl. 220-273.000.

Takeda, Yasuhide: *See*—
Kishi, Tuneo; Takeda, Yasuhide; Tsubaki, Toru; and Takahashi, Takeshi, 4,417,111., Cl. 200-148.00R.

Takemae, Yoshihiro: *See*—
Mezawa, Tsutomu; Kabashima, Katsuhiko; Nozaki, Shigeki; and Takemae, Yoshihiro, 4,417,329., Cl. 365-203.000.

Takemoto, Toyoki: *See*—
Inoue, Michihiro; Takemoto, Toyoki; and Yamada, Haruyasu, 4,417,233., Cl. 340-347.0AD.

Takenaka, Akira; Shimazaki, Keiichi; and Kuwazuru, Yasumitsu, to Taiho Kogyo Kabushiki Kaisha. Mechanical face seal with minute pores in sliding surface. 4,416,458., Cl. 277-96.100.

Takenaka, Yoshinori: *See*—
Kuroda, Toru; Takenaka, Yoshinori; and Tsuda, Nobuaki, 4,416,777., Cl. 210-446.000.

Takesako, Yoshinobu; Watanabe, Masanori; and Nonomura, Kinzo, to Matsushita Electric Industrial Co., Ltd. Picture image display apparatus. 4,417,184., Cl. 315-366.000.

Takeshita, Masatoshi: *See*—
Asano, Atsushi; Takeshita, Masatoshi; Nishida, Hideki; Suzuki, Ryo; and Futami, Toshio, 4,417,323., Cl. 365-1.000.

Takeuchi, Hideaki; Takahashi, Tsunehiko; and Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Apparatus for detecting and measuring defects. 4,417,149., Cl. 250-563.000.

Takeuchi, Hiroo; Hachiro, Nobuaki; and Miyazaki, Yoshihisa, to Nissin Kogyo Kabushiki Kaisha. Vacuum booster device. 4,416,191., Cl. 92-165.0PR.

Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Iinuma, Hironobu; and Kunimoto, Setsuko, 4,416,899., Cl. 424-320.000.

Takezawa, Teruhiro: *See*—
Hirahata, Shigeru; Takezawa, Teruhiro; Onuki, Nobuo; Komatsu, Shigeru; and Tachiuchi, Tsuguji, 4,417,318., Cl. 364-900.000.

Takimoto, Masaaki; Saida, Takashi; and Murata, Masataka, to Fuji Photo Film Co., Ltd. Electrically-conductive support for electrophotographic light-sensitive medium. 4,416,963., Cl. 430-69.000.

Takimoto, Tadashi; Oishibashi, Hirotsugu; Ueyama, Katsuyoshi; Ohara, Muneyuki; Nakamura, Mitsuo; and Amano, Takayoshi, to Japanese National Railways; and Hakusan Seissaku-sho Co., Ltd. Punching-shearing method for inspecting quality of butt welded joint. 4,416,158., Cl. 73-842.000.

Takitani, Masaru; Baba, Keikichi; and Tomiyasu, Shizuo, to Toyo Stauffer Chemical Co., Ltd. Catalytic component for polymerizing α-olefin and method for homo- or co-polymerization of α-olefin. 4,416,799., Cl. 502-156.000.

Tamura, Masuhiko: *See*—
Yoshimura, Noriaki; and Tamura, Masuhiko, 4,417,079., Cl. 568-903.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Nagao, Susumu; Kurabayashi, Katsuhiko; Futamura, Nobuyuki; Kinoshita, Hidefumi; and Takahashi, Toshio, 4,416,819., Cl. 260-293.30B.

Tanaka, Chuji: *See*—
Morikawa, Masaki; Yoshida, Hideaki; Kishida, Kunio; and Tanaka, Chuji, 4,416,853., Cl. 420-469.000.

Tanaka, Haruhiko: *See*—
Makabe, Hachiro; Tanaka, Haruhiko; and Orii, Akira, 4,417,188., Cl. 318-696.000.

Tanaka, Hisami: *See*—
Ito, Akihiko; Tanaka, Hisami; Takayama, Yoshihisa; and Kato, Seiji, 4,417,158., Cl. 307-269.000.

Tanaka, Kazutoshi: *See*—
Takami, Akio; Saito, Tsutomu; Sekiya, Toshifumi; and Tanaka, Kazutoshi, 4,417,228., Cl. 338-34.000.

Tanaka, Shinsuke; Imamura, Nobutake; and Ota, Chuichi, to Kokusai Denshindenwa Co., Ltd. Multi-layer magneto-optical recording medium. 4,417,290., Cl. 360-131.000.

Tanaka, Yasuhinori; and Chikamasa, Hiroshi, to Fuji Photo Film Co., Ltd. Coating apparatus. 4,416,214., Cl. 118-410.000.

Tanaka, Yoshimitsu: *See*—
Hirotani, Yasunari; and Tanaka, Yoshimitsu, 4,416,487., Cl. 296-222.000.

Tanner, Curtis J.; Bender, Richard E.; Simson, Anton K.; and McCutchen, Hugh, Jr., to Henlan, Inc. Oil well setup and pumping apparatus. 4,416,329., Cl. 166-68.000.

Tanner, Nathan S.: *See*—
Hogg, Grady R., Jr.; and Tanner, Nathan S., 4,417,344., Cl. 373-93.000.

Tanaetics, Inc.: *See*—
Johnson, Robert A., 4,416,122., Cl. 62-448.000.
Tappe, Horst; and Roth, Kurt, to Cassella Aktiengesellschaft. Water-insoluble azo dyestuff, for discharge printing. 4,416,665., Cl. 8-464.000.
Tardy, John, to Western Electric Company, Inc. Methods of testing the integrity of an electrical coil as it is wound. 4,416,057., Cl. 29-605.000.
Tarjan, Peter P.: *See*—
Saulson, Stanley H.; and Tarjan, Peter P., 4,416,282., Cl. 128-419.0PG.
Tarrant Manufacturing Company: *See*—
Stacey, Ralph C., 4,416,475., Cl. 285-229.000.
Tarui, Jun: *See*—
Shiozaki, Makoto; Haseda, Satoshi; Tarui, Jun; Ito, Osamu; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Kawai, Shizuo; and Sami, Hiroshi, 4,416,232., Cl. 123-357.000.
Taruishi, Yoshiaki: *See*—
Kodama, Tasuku; and Taruishi, Yoshiaki, 4,416,850., Cl. 376-310.000.
Tashiro, Hidetaka: *See*—
Numazawa, Masaaki; Tashiro, Hidetaka; and Ishii, Shuichi, 4,416,658., Cl. 604-48.000.
Tashiro, Makoto: *See*—
Iwamoto, Masami; Tashiro, Makoto; Beppu, Tatsuro; and Kasami, Akinobu, 4,417,262., Cl. 357-17.000.
Tashlick, Irving: *See*—
Corea, John E.; Corea, Emanuel R.; and Tashlick, Irving, 4,416,841., Cl. 264-102.000.
Tatabanyai Szenbanyak: *See*—
Gencev, Dinko; Szabo nee Mogyorosi, Katalin; Riederauer, Szilard; and Szepvolgyi, Janos, 4,416,862., Cl. 423-335.000.
Szebenyi, Ferenc; Nemeth, Janos; Bohnert, Jozsef; Solymos, Andras; Petrassy, Miklos; Kovacs, Tamas; Krupanszky, Jozsef; and Noll, Istvan, 4,416,566., Cl. 405-291.000.
Tatano, Toshio: *See*—
Tsuda, Mitsuru; Miike, Akira; Shimizu, Yoshiaki; Yokote, Yasuharu; and Tatano, Toshio, 4,416,982., Cl. 435-11.000.
Taylor, Allan D., to Bechtel International Corporation. Particle separating screen unit for agitation tank. 4,416,774., Cl. 210-236.000.
Taylor, Alvin: *See*—
Klein, George; Manber, Solomon; Sudhalter, Marvin; and Taylor, Alvin, 4,417,151., Cl. 307-24.000.
Taylor, Raymond L.: *See*—
Galasso, Francis S.; Veltri, Richard D.; and Taylor, Raymond L., 4,416,717., Cl. 156-242.000.
Tazmo Co., Ltd.: *See*—
Sakiya, Fumio, 4,416,213., Cl. 118-52.000.
Tazuma, James J.: *See*—
Gloth, Richard E.; and Tazuma, James J., 4,417,017., Cl. 524-255.000.
TDK Electronics Co., Ltd.: *See*—
Ohkawa, Takehisa; and Yoda, Kuniichi, 4,416,948., Cl. 428-447.000.
Ohya, Kazuo; Fujishima, Hiroki; Ishijima, Norio; Itoga, Hiroyoshi; and Kominami, Yasuhiko, 4,416,709., Cl. 148-403.000.
Saito, Seitoku, 4,416,943., Cl. 428-333.000.
Yoda, Kuniichi; and Ohkawa, Takehisa, 4,416,947., Cl. 428-447.000.
Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH: *See*—
Fleischmann, Heinz; and Steckmann, Helmut, 4,417,152., Cl. 307-64.000.
Technitrol, Inc.: *See*—
McInerny, George P., 4,416,449., Cl. 271-122.000.
Tecumseh Products Company: *See*—
MacLeod, John N., 4,417,195., Cl. 322-58.000.
Tehrani, Norman N.: *See*—
Wolfram, Leszek J.; Cohen, David; and Tehrani, Norman N., 4,416,297., Cl. 132-7.000.
Teijin Limited: *See*—
Inata, Hiroo; and Matsumura, Shunichi, 4,416,839., Cl. 264-49.000.
Kimura, Akio; Wada, Osamu; Owaki, Shinji; and Seimitsu, Kozo, 4,416,934., Cl. 428-224.000.
Ogawa, Yoshinari; Akagi, Noriyuki; Ikeda, Kenji; and Nakamura, Yoichi, 4,417,018., Cl. 524-261.000.
Teikoku Hormone Mfg. Co. Ltd.: *See*—
Enomoto, Shogo; Sawai, Masanobu; Seo, Iwao; and Yamaguchi, Tomonobu, 4,416,269., Cl. 128-41.000.
Teledyne Industries, Inc.: *See*—
Cammack, Michael A.; Elkins, Christopher W.; Hickman, Clarence J.; and Mullins, Keith M., 4,416,628., Cl. 433-80.000.
Telefunken Electronic GmbH: *See*—
Romacker, Bertold, 4,416,066., Cl. 33-318.000.
Tengblad, Per F.: *See*—
Wiberger, Lars I.; Ronnow, Peter H.; Tengblad, Per F.; and Hellman, Bert G. H., 4,416,332., Cl. 166-246.000.
Terajima, Jiro, to Alps Electric Co., Ltd. Slide switch. 4,417,107., Cl. 200-16.00C.
Terakura, Yukio: *See*—
Kubo, Seitoku; Terakura, Yukio; Nakamura, Shinya; and Asami, Ken, 4,417,307., Cl. 364-424.100.
Terase, Kunihiko: *See*—
Sato, Kimihiko; Terase, Kunihiko; Kijimuta, Hitoshi; and Ohta, Yukinori, 4,416,863., Cl. 423-344.000.
Terashita, Takaaki, to Fuji Photo Film Co., Ltd. Method of locating abnormal originals. 4,416,539., Cl. 355-77.000.
Teshima, Takashi: *See*—
Miyakawa, Nobuhiro; Teshima, Takashi; Koyama, Haruo; Maekawa, Kouji; and Fujii, Masanori, 4,416,964., Cl. 430-106.600.
Tetra Werke Dr. rer. nat. Ulrich Baensch GmbH: *See*—
Panthofer, Rudolf; and Ley, Hans, 4,416,037., Cl. 24-665.000.
Tewfik, Farouk F. Liquid volume indicator. 4,417,232., Cl. 340-59.000.
Texaco Inc.: *See*—
Canup, Robert E., 4,416,246., Cl. 123-618.000.
Kaufman, Benjamin J.; Sung, Rodney L.; and Sweeney, William M., 4,416,667., Cl. 44-56.000.
Larkin, John M.; and Watts, Lewis W., Jr., 4,417,082., Cl. 585-10.000.
McMahon, Matthew A.; Wilson, Raymond F.; Eng, King D.; and Burns, Robert B., 4,416,674., Cl. 55-485.000.
von Klock, Byron; and Vuong, Dinh-Cuong, 4,416,996., Cl. 436-6.000.
Texas Instruments Incorporated: *See*—
McElroy, David J., 4,416,049., Cl. 29-571.000.
Textron Inc.: *See*—
Black, Daniel A., 4,416,572., Cl. 411-38.000.
Th. Goldschmidt AG: *See*—
Kollmeier, Hans-Joachim; and Langenhagen, Rolf-Dieter, 4,417,068., Cl. 556-479.000.
Thermocatalytic Corp.: *See*—
Craig, Laurence B.; and Farina, Alfred J., 4,416,619., Cl. 431-328.000.
Thibert, Jean-Jacques; Rodde, Anne-Marie; and Pouradier, Jean-Marc E., to Societe Nationale Industrielle Aerospatiale; and Office National d'Etudes et de Recherches Aerospatiales. Blade section for rotating wings of an aircraft. 4,416,434., Cl. 244-35.00R.
Thiele, Gerald H., to Stauffer Chemical Company. Synergistic herbicidal compositions. 4,416,684., Cl. 71-95.000.
Thilo, Peer: *See*—
Scherer, Hartmut; and Thilo, Peer, 4,416,067., Cl. 33-356.000.
Thimot, Robert P., to Hudson Lock, Inc. Cylinder lock with key removable plug. 4,416,129., Cl. 70-369.000.
Thomas, Patrick D. P.: *See*—
Postle, Stephen R.; Thomas, Patrick D. P.; and Whitear, Brian R. D., 4,417,072., Cl. 560-86.000.
Thomas, Richard N.; and Braggins, Timothy T., to Westinghouse Electric Corp. Restoration of high infrared sensitivity in extrinsic silicon detectors. 4,416,051., Cl. 29-572.000.
Thomas, Richard N.; and Sopira, Michael M., to Westinghouse Electric Corp. Method of batch-fabricating flip-chip bonded dual integrated circuit arrays. 4,416,054., Cl. 29-572.000.
Thomas, Roy L.: *See*—
Bergman, Carl A.; Thomas, Roy L.; and Bourbeau, Richard A., 4,416,722., Cl. 156-578.000.
Thompson, James G. Combination extractor and hold down mechanism for a bolt-action rifle. 4,416,077., Cl. 42-25.000.
Thompson, Jeffrey W.: *See*—
Murphy, Edward J.; Lewarchik, Ronald J.; and Thompson, Jeffrey W., 4,416,750., Cl. 204-159.190.
Thompson, Judith D. Removeable cushion for a shopping cart. 4,416,462., Cl. 280-33.99B.
Thompson, Neil E. S., to Petrolite Corporation. Antistatic agents for organic liquids. 4,416,668., Cl. 44-62.000.
Thompson, Stanley C. Portable fountain for pools or spas. 4,416,420., Cl. 239-22.000.
Thompson, Stephen W.: *See*—
Ingle, William M.; Darnell, Robert D.; and Thompson, Stephen W., 4,416,913., Cl. 427-45.100.
Thomson-CSF: *See*—
Grousseau, Alain, 4,417,250., Cl. 343-405.000.
Le Sonn, Marcel, 4,417,357., Cl. 378-177.000.
Thornburg, Donald R.: *See*—
Foster, Karl; Rauch, Gary C.; Swift, Wayne M.; and Thornburg, Donald R., 4,416,707., Cl. 148-111.000.
Thorne, J. Paul, to Newcor, Inc. Resistance welding system for projection welding. 4,417,122., Cl. 219-108.000.
Thorne-Thomsen, Thomas, to Olin Corporation. Apparatus for simultaneously forming a cap member with internal threads. 4,416,142., Cl. 72-348.000.
Thorogood, Peter B., to Burroughs Wellcome Co. Imidazole derivatives and salts thereof, their synthesis and intermediates and pharmaceutical formulations. 4,416,895., Cl. 424-273.00R.
Three Bond Co., Ltd.: *See*—
Okamura, Yasuhumi; Masaoka, Aritatsu; and Kishita, Kazutaka, 4,417,040., Cl. 526-323.100.
Thubeauville, Heinz: *See*—
Gernhardt, Paul; Thubeauville, Heinz; and Struck, Carl-Heinz, 4,416,732., Cl. 202-139.000.
Thyssen Industrie AG: *See*—
Muller, Erwin; Kollmann, Bernd; Sonnabend, Ferdinand; Petzolt, Gert; Balz, Josef; Walloschek, Bernhard; and Risse, Friedrich, 4,416,409., Cl. 228-173.00R.
Tillyard, Malcolm: *See*—
Shutt, Joseph A.; Tutt, Kingsley J.; Tillyard, Malcolm; and Brown, Terence J., 4,416,031., Cl. 12-127.000.
Tinnis, Valentin, to Ekono Oy; and A. Ahlstrom Osakeyhtio. Steplessly adjustable device for injecting black liquor into a soda digester. 4,416,422., Cl. 239-455.000.
TOA Nenryo Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Noboru; Morikubo, Keiichi; Komatsu, Masato; and Sei, Kazuo, 4,417,019., Cl. 524-456.000.
Toba, Hirotaka; Mikumo, Masatoshi; and Asami, Masahiro, to Daicel Chemical Industries, Ltd. Resin composition emulsion. 4,417,025., Cl. 525-54.210.

Toda, Minoru; and Osaka, Susumu, to RCA Corporation. Photoelectric drive circuit for a piezoelectric bimorph element. 4,417,169., Cl. 310-317.000.
Todoroki, Tsunehiko: *See*—
Nakata, Koreaki; Todoroki, Tsunehiko; Oita, Masahiro; and Oshima, Nobumasa, 4,417,298., Cl. 361-433.000.
Tohoku Metal Industries, Ltd.: *See*—
Sato, Yoshiro, 4,417,207., Cl. 324-158.00R.
Tokieda, Akinori; and Takasugi, Sumio, to Yokohama Rubber Co., Ltd., The. Rubber compositions for tire treads. 4,417,005., Cl. 523-351.000.
Tokunaga, Kazuyoshi; and Anzai, Masayasu, to Hitachi, Ltd. Nonimpact printer. 4,416,533., Cl. 355-4.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hashizume, Kenichi, 4,416,223., Cl. 122-367.00C.
Hattori, Toshiaki; and Hashimoto, Yasuichi, 4,417,288., Cl. 360-74.100.
Hirata, Akio, 4,417,193., Cl. 318-803.000.
Hoshimi, Susumu; and Kojima, Tadashi, 4,417,283., Cl. 358-310.000.
Iinuma, Kazuhiro; Seo, Yasutsugu; and Sato, Shigeru, 4,416,286., Cl. 128-663.000.
Iwamoto, Masami; Tashiro, Makoto; Beppu, Tatsuro; and Kasami, Akinobu, 4,417,262., Cl. 357-17.000.
Kamei, Taketo; Hayashi, Motokazu; Osada, Kimio; and Kimura, Mitsutoshi, 4,417,176., Cl. 315-59.000.
Kodama, Tasuku; and Taruishi, Yoshiaki, 4,416,850., Cl. 376-310.000.
Nagao, Nobuya; and Inoue, Takashi, 4,417,270., Cl. 358-23.000.
Nakada, Minoru; Shimma, Yashiro; Inoue, Osamu; and Suma, Sei, 4,416,327., Cl. 165-122.000.
Ochii, Kiyofumi, 4,417,328., Cl. 365-203.000.
Onodera, Toshihiro; Masuda, Youichi; Nakajima, Akira; Takamura, Yoshio; Kajiwara, Seiji; and Higo, Shoichi, 4,417,153., Cl. 307-140.000.
Takaoka, Takashi; Mochizuki, Masahiko; Yamashita, Mitsuo; and Miura, Tadao, 4,417,331., Cl. 369-111.000.
Yamamoto, Kazuhiko, 4,417,282., Cl. 358-296.000.
Tolley, William K., to UOP, Inc. Recovery of titanium metal values. 4,416,693., Cl. 75-101.00R.
Tomikawa, Ryoichi: *See*—
Suzuki, Kiyohisa; Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; Ban, Hiroshi; and Ishida, Nobuyasu, 4,416,361., Cl. 192-107.00M.
Tomioka, Shunzo; Okano, Kinpei; Matsuo, Masanori; Hasegawa, Akira; and Kitamura, Akira, to Hitachi, Ltd. Bearing system for vertical type rotary machine. 4,416,555., Cl. 384-415.000.
Tomita, Akitsu: *See*—
Narita, Kiichi; Tomita, Akitsu; Katagiri, Nozomu; Seki, Kazuyuki; Sato, Tetuo; Kitamura, Minoru; Kawasaki, Shozo; and Kanazuka, Yasuo, 4,416,691., Cl. 75-60.000.
Tomiyasu, Shizuo: *See*—
Takitani, Masaru; Baba, Keikichi; and Tomiyasu, Shizuo, 4,416,799., Cl. 502-156.000.
Tomizawa, Takayuki: *See*—
Ikeda, Mikio; and Tomizawa, Takayuki, 4,416,813., Cl. 260-117.000.
Tomkins, Donald W.: *See*—
Ball, Matthew C.; and Tomkins, Donald W., 4,416,695., Cl. 106-90.000.
Tonomura, Kenichi; Kadokawa, Shigeru; and Ohsawa, Michinao, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Television receivers. 4,417,277., Cl. 358-177.000.
Toray Silicone Company, Ltd.: *See*—
Koda, Yoshinobu; Ona, Isao; and Takeda, Atsushi, 4,417,024., Cl. 524-861.000.
Totten, Roger, to Draft Systems, Inc. Load lowering device. 4,416,430., Cl. 242-107.300.
Tottori, Takafumi, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus. 4,416,535., Cl. 355-14.00D.
Touborg, Jorn, to F. L. Smidth & Co. Method and plant such as a kiln plant for treating granular or pulverous raw material. 4,416,622., Cl. 432-14.000.
Touchwood International S.A.: *See*—
Sarkissian, Vahe, 4,416,072., Cl. 36-100.000.
Touhou, Makoto; Wada, Shigeaki; and Yamamoto, Minoru, to Matsushita Electric Works, Ltd. Low pressure discharge lamp. 4,417,172., Cl. 313-156.000.
Towsley, John A., to John Alan Enterprises. Weaving loom with interchangeable sections. 4,416,040., Cl. 28-152.000.
Toyo Kogyo Co., Ltd.: *See*—
Hirotani, Yasunari; and Tanaka, Yoshimitsu, 4,416,487., Cl. 296-222.000.
Iida, Koso, 4,416,115., Cl. 60-600.000.
Toyo Rubber Industry Co., Ltd., The: *See*—
Kan, Masanori; Okazaki, Takuya; and Sakashita, Tatsuo, 4,417,027., Cl. 525-99.000.
Toyo Stauffer Chemical Co., Ltd.: *See*—
Takitani, Masaru; Baba, Keikichi; and Tomiyasu, Shizuo, 4,416,799., Cl. 502-156.000.
Toyoda, Kazuhiro; and Sugo, Yasuhisa, to Fujitsu Limited. Static semiconductor memory device. 4,417,326., Cl. 365-190.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Yamakage, Tetsuro; and Takashima, Toshiharu, 4,416,569., Cl. 408-4.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Matsuoka, Hiroki, 4,416,240., Cl. 123-493.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Aoki, Keiji; and Mitsuyasu, Masaki, 4,416,237., Cl. 123-438.000.
Arai, Hajime; and Haga, Shoji, 4,416,168., Cl. 74-740.000.
Imamura, Noriaki, 4,416,227., Cl. 123-198.00D.
Katagiri, Masayoshi; Fujii, Takashi; and Ogura, Osamu, 4,416,188., Cl. 91-369.00B.
Kato, Keigo; and Kuroiwa, Yosio, 4,416,242., Cl. 123-549.000.
Kubo, Seitoku; Terakura, Yukio; Nakamura, Shinya; and Asami, Ken, 4,417,307., Cl. 364-424.100.
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,416,235., Cl. 123-425.000.
Trane Company, The: *See*—
Eber, David H.; and Butterworth, Arthur L., 4,416,597., Cl. 418-55.000.
Tremeaux, Michel. Moulding machine, more especially a chill moulding machine comprising a framework and at least one core extraction jack mounted on a bearing element movable on the framework. 4,416,322., Cl. 164-340.000.
Tribolet, David C.; and Kemplin, Richard M., to Hewlett-Packard Company. Bi-directional pen changer. 4,417,258., Cl. 346-139.00R.
Trihey, John M., to Malz Nominees Pty. Ltd. Heat operated pump. 4,416,587., Cl. 417-52.000.
Troendle, Inc.: *See*—
Troendle, Roy A., Sr., 4,416,100., Cl. 52-390.000.
Troendle, Roy A., Sr., to Troendle, Inc. Modular wooden floor units and method of manufacture thereof. 4,416,100., Cl. 52-390.000.
Truluck, Donovan. Support hanger kit for suspension ceilings and method of installation. 4,416,095., Cl. 52-173.00R.
Tseung, Alfred C. C.; and Jasem, Sameer M. Gas extraction. 4,416,758., Cl. 204-258.000.
Tsubaki, Toru: *See*—
Kishi, Tuneo; Takeda, Yasuhide; Tsubaki, Toru; and Takahashi, Takeshi, 4,417,111., Cl. 200-148.00R.
Tsuchiya, Kazumichi: *See*—
Yokoyama, Tsuneo; and Tsuchiya, Kazumichi, 4,417,280., Cl. 358-227.000.
Tsuda, Mitsuru; Miike, Akira; Shimizu, Yoshiaki; Yokote, Yasuharu; and Tatano, Toshio, to Kyowa Hakko Kogyo Co., Ltd. Composition and method for decomposing hydrogen peroxide. 4,416,982., Cl. 435-11.000.
Tsuda, Nobuaki: *See*—
Kuroda, Toru; Takenaka, Yoshinori; and Tsuda, Nobuaki, 4,416,777., Cl. 210-446.000.
Tsujii, Yasuhiro: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Nishimura, Shigeyuki, 4,417,055., Cl. 546-345.000.
Tsukamoto, Goro: *See*—
Sakamoto, Fumio; Ikeda, Shoji; and Tsukamoto, Goro, 4,416,891., Cl. 424-270.000.
Tsutsumi, Akira, to Amada Engineering & Service Co., Inc. Laser processing machine. 4,417,125., Cl. 219-121.0LY.
Tsuzuki, Yoshihiko: *See*—
Shiozaki, Makoto; Haseda, Satoshi; Tarui, Jun; Ito, Osamu; Hobo, Nobuhito; Tsuzuki, Yoshihiko; Kawai, Shizuo; and Sami, Hiroshi, 4,416,232., Cl. 123-357.000.
Tuck, Richard A.; and Skinner, Heather B., to E M I-Varian Limited. Thermionic electron emitters and methods of making them. 4,417,173., Cl. 313-346.00R.
Tuereswerke Riexinger GmbH & Co., KG: *See*—
Riexinger, Gustav; and Nagel, Rudolf, 4,416,047., Cl. 29-460.000.
Tumasian, Beniamin A.: *See*—
Pelts, Boris B.; Tumasian, Beniamin A.; Egorov, Leonid P.; Zatulovsky, Lev M.; Chaikin, Peter M.; Freiman, Efim A.; Chalian, Eduard A.; Abramian, Grant I.; Azoian, Stepan E.; and Kostandian, Kliment A., 4,416,723., Cl. 156-608.000.
Turi, Edith A.: *See*—
Khanna, Yash P.; Turi, Edith A.; Aharoni, Shaul M.; and Largman, Theodore, 4,417,032., Cl. 525-432.000.
Turner, Frederick T., to Varian Associates, Inc. Apparatus for asymmetrically contouring the thickness of sputter coated layers. 4,416,760., Cl. 204-298.000.
Turner, Frederick T.: *See*—
Harra, David J.; Turner, Frederick T.; and Hutchinson, Martin A., 4,416,759., Cl. 204-298.000.
Turner, Wallace, to Rolls-Royce Limited. Electroplating of titanium and titanium base alloys. 4,416,739., Cl. 204-32.00R.
Turpin, Raymond L.; and Medford, William K. Leaf stripper. 4,416,294., Cl. 130-30.00R.
Tutt, Kingsley J.: *See*—
Shutt, Joseph A.; Tutt, Kingsley J.; Tillyard, Malcolm; and Brown, Terence J., 4,416,031., Cl. 12-127.000.
Udovich, Carl A.; and Edwards, Robert C., to Standard Oil Co. (Indiana). Catalysts for the production of maleic anhydride by the oxidation of butane. 4,416,802., Cl. 502-209.000.
Udovich, Carl A.; Hirschberg, Eugene H.; and Bertolacini, Ralph J., to Standard Oil Company (Indiana). Process for the manufacture of catalysts useful for the oxidation of butane to malelic anhydride. 4,416,803., Cl. 502-209.000.
UE Systems, Inc.: *See*—
Goodman, Mark; Zeno, John R.; and Borruso, Marty, 4,416,145., Cl. 73-40.50A.
Uesugi, Kyozo, to Minolta Camera Kabushiki Kaisha. Automatic and manual focus control for objective lens assembly. 4,416,513., Cl. 350-255.000.

Uesugi, Masaru: *See*—
Otsuki, Yoshio; Uesugi, Masaru; and Ieda, Nobuaki, 4,417,163., Cl. 307-475.000.
Ueyama, Katsuyoshi: *See*—
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Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Kaji, Kiyokane; and Banno, Mitsuyuki, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition timing control apparatus for internal combustion engine. 4,416,235., Cl. 123-425.000.
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van de Steeg, Antonius T. H.; and van Mondfrans, Gerardus H., to Stork Brabant B.V. Method and installation for cleaning a squeegee device. 4,416,704., Cl. 134-34.000.
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Vogel, Hans-Henning; Schramm, Manfred; Werner, Michael; and Schwartz, Erich, to BASF Aktiengesellschaft. Ethylene-alkyne copolymers, their preparation and their use as additives to petroleum distillates. 4,417,038., Cl. 526-285.000.

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Vorres, Karl S., to Institute of Gas Technology. Fluidized bed gasifier or similar device for simultaneous classification of ash and unreacted coal. 4,416,857., Cl. 422-145.000.

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Vsesojuzny Nauchno-issledovatelsky i proektno-konstruktorsky institut po avtomatizatsil predpriyaty promyshlennosti stroitelnykh materialov: *See*—
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Wallace, John G. Solar collector. 4,416,265., Cl. 126-446.000.

Waller, Francis J., to Du Pont de Nemours, E. I., and Company. Toluic acid. 4,416,801., Cl. 502-153.000.

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Walls, John E.; Dragon, Robert L.; and Dunder, Thomas A., to American Hoechst Corporation. Electrolytic graining of aluminum with nitric and boric acids. 4,416,972., Cl. 430-278.000.

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Watkins, James D., to Golden Valley Foods Inc. Process for preparing food packages for microwave heating. 4,416,907., Cl. 426-234.000.

Watkins, Larry A.; and Robinson, Leon H., Jr., to Exxon Production Research Co. Apparatus for maintaining a coiled electric conductor in a drill string. 4,416,494., Cl. 339-15.000.

Watson, James M.; Forward, Cleve H.; and Butler, James R., to Cosden Technology, Inc. Process for the production of vinyltoluene. 4,417,085., Cl. 585-440.000.

Watt, Richard E. Engine over-temperature and oil pressure loss audible warning device. 4,417,231., Cl. 340-52.00F.

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Foster, Karl; Rauch, Gary C.; Swift, Wayne M.; and Thornburg, Donald R., 4,416,707., Cl. 148-111.000.
Husson, Alan L.; and Uherek, Vladimir, 4,416,352., Cl. 187-29.00R.
Mathews, Bruce D., 4,417,248., Cl. 343-16.00M.
McGinnis, Ralph E.; and Gray, Lewis, 4,416,457., Cl. 277-53.000.
Thomas, Richard N.; and Braggins, Timothy T., 4,416,051., Cl. 29-572.000.
Thomas, Richard N.; and Sopira, Michael M., 4,416,054., Cl. 29-572.000.
Vaill, Ronald E.; Ciccotelli, Stephen S.; and Merola, Carl R., 4,417,108., Cl. 200-50.0AA.
White, Marvin H.; and Mack, Ingham A. G., 4,417,317., Cl. 364-825.000.

Westvaco Corporation: *See—*
Hager, Donald G.; Massey, Michael L.; and Rubel, Frederick, Jr., 4,416,798., Cl. 502-420.000.

Wevers, Jean: *See—*
Barrat, Christian R.; Walker, John R.; and Wevers, Jean, 4,416,793., Cl. 252-117.000.
Barrat, Christian R.; Walker, John R.; and Wevers, Jean, 4,416,794., Cl. 252-174.150.

Weyland, Horst: *See—*
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,416,870., Cl. 424-172.000.

Weynant, Eric: *See—*
Kepes, Andre; Weynant, Eric; Avenas, Pierre; and Haudin, Jean-Marc, 4,417,041., Cl. 526-348.600.

Wheeler, Robert P., Jr., to Concord Laboratories, Inc. Sterilization indicator. 4,416,984., Cl. 435-31.000.

Whelchel, Robert C.: *See—*
Sanderson, Roger S.; and Whelchel, Robert C., 4,416,417., Cl. 236-92.00R.

Whirlpool Corporation: *See—*
Wilson, Raymond G.; and Frohbieter, Edwin H., 4,416,119., Cl. 62-149.000.

White, Jack D., Jr., to Dayco Corporation. Belt tensioner. 4,416,647., Cl. 474-134.000.

White, Marvin H.; and Mack, Ingham A. G., to Westinghouse Electric Corp. Adaptive analog processor. 4,417,317., Cl. 364-825.000.

Whitear, Brian R. D.: *See—*
Postle, Stephen R.; Thomas, Patrick D. P.; and Whitear, Brian R. D., 4,417,072., Cl. 560-86.000.

Whitefield, John T.: *See—*
Wise, Stephen A.; and Whitefield, John T., 4,416,182., Cl. 84-470.00R.

Wiberger, Lars I.; Ronnow, Peter H.; Tengblad, Per F.; and Hellman, Bert G. H., to Chemical Dynamics Sweden AB. Method for increasing the pressure in oil-bearing geological structures. 4,416,332., Cl. 166-246.000.

Wickmann-Werke GmbH: *See—*
Asdollahi, Norbert; and Gutzmer, Christian, 4,417,226., Cl. 337-273.000.

Wiechert, Rudolf: *See—*
Petzoldt, Karl; Wiechert, Rudolf; Laurent, Henry; Nickisch, Klaus; and Bittler, Dieter, 4,416,985., Cl. 435-58.000.

Wikstrom, Bo B., to SAB Industri AB. Magneto-optic transducer. 4,417,324., Cl. 365-10.000.

Wilhelm Rogg Kunststoff-Metallistierung: *See—*
Neumeister, Ernst, 4,416,602., Cl. 425-130.000.

Wilkins, John J., to E.W. Buschman Company, The. Drive wheel and sprocket assembly. 4,416,650., Cl. 474-161.000.

Wilkinson, Harlen E.; and Wren, Fred W., to American Can Company. Retained tab easy open end (small pour hole). 4,416,389., Cl. 220-269.000.

Wilkinson-Tough, Gordon S., to International Gas Detectors Limited. Gas sensor elements and methods of manufacturing them. 4,416,911., Cl. 427-12.000.

Willette, Albert D., to AMP Incorporated. Method for splicing a flat conductor cable enclosed within a sealed envelope. 4,417,096., Cl. 174-71.00R.

Williams, Griff E.: *See—*
Lecznar, Chester J.; and Williams, Griff E., 4,416,600., Cl. 425-7.000.

Williams, Robert C., to Innovative Medical Systems, Corp. Method of compensating a thermistor. 4,416,153., Cl. 73-295.000.

Williamson, Harry L.; West, Robert A.; and Manning, Richard P., to Intercontinental Data Corporation. Stacked article counting apparatus. 4,417,351., Cl. 377-8.000.

Williamson, Roger J.; and Batchelder, David N., to ITT Industries, Inc. Vortex flowmeter. 4,416,159., Cl. 73-861.220.

Wilmington Chemical Corporation: *See—*
Bowditch, W. Raymond, 4,417,033., Cl. 525-481.000.

Wilson, Francis M., Jr., to Lockheed Corporation. Aerial transport of payloads with vertical pick up and delivery. 4,416,436., Cl. 244-137.00R.

Wilson, H. James, to Safetran Systems Corporation. Means for use on a railroad to distinguish between traction current and signal current. 4,417,229., Cl. 340-47.000.

Wilson, Herbert C., to Dresser Industries, Inc. Formation fluid testing and sampling apparatus. 4,416,152., Cl. 73-155.000.

Wilson, John H.: *See—*
Berry, Richard E.; and Wilson, John H., 4,417,322., Cl. 364-900.000.

Wilson, Larry R.: *See—*
Killat, George R.; and Wilson, Larry R., 4,416,729., Cl. 162-164.300.

Wilson, Raymond F.: *See—*
McMahon, Matthew A.; Wilson, Raymond F.; Eng, King D.; and Burns, Robert B., 4,416,674., Cl. 55-485.000.

Wilson, Raymond G.; and Frohbieter, Edwin H., to Whirlpool Corporation. Variable capacity binary refrigerant refrigeration apparatus. 4,416,119., Cl. 62-149.000.

Wilson, Richard A.: *See—*
Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; and Zampino, Michael J., 4,416,902., Cl. 426-3.000.

Winecki, Henry: *See—*
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Winiecki, Martha: *See—*
Winiecki, Tadeus, 4,416,465., Cl. 280-290.000.

Winiecki, Tadeus, to Winiecki, Martha; and Winecki, Henry, a part interest. Crash resistant motorcycle. 4,416,465., Cl. 280-290.000.

Winstead, Thomas W., to Maryland Cup Corporation. Apparatus for the continuous formation of biaxially oriented thermoplastic materials and forming articles therefrom by intermittent forming means interfaced therewith. 4,416,607., Cl. 425-325.000.

Wintucky, Edwin G.: *See*—
Curren, Arthur N.; Forman, Ralph; Sovey, James S.; and Wintucky, Edwin G., 4,417,175., Cl. 315-5.380.
Wirz, Armin: *See*—
Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, 4,416,041., Cl. 28-255.000.
Wischusen, Henry, III, to Rock-Tenn Company. Collapsible carton with interior partitions. 4,416,412., Cl. 229-41.00R.
Wisconsin Alumni Research Foundation: *See*—
Davida, George I., 4,417,338., Cl. 371-37.000.
Wise, Stephen A.; and Whitefield, John T., to Allen Organ Company. Keyboard instrument teaching device. 4,416,182., Cl. 84-470.00R.
Wixon, Harold E., to Colgate-Palmolive Company. Detergent softener compositions. 4,416,811., Cl. 252-8.750.
Wojnarowski, Robert J.: *See*—
Eichelberger, Charles W.; and Wojnarowski, Robert J., 4,416,914., Cl. 427-54.100.
Wojtowicz, John A., to Olin Corporation. Process for calcium hypochlorite. 4,416,864., Cl. 423-474.000.
Wolber, Robert; and Maurer, Roland, to Gebruder Junghans GmbH. Drive assembly for a timepiece. 4,416,550., Cl. 368-88.000.
Wolfram, Leszek J.; Cohen, David; and Tehrani, Norman N., to Clairol Incorporated. Hair waving or straightening process and product. 4,416,297., Cl. 132-7.000.
Woltersdorf, Otto W., Jr., to Merck & Co., Inc. Benzothiazolesulfonamide derivatives for the topical treatment of elevated intraocular pressure. 4,416,890., Cl. 424-270.000.
Womack, Charles E. Catheter securing device. 4,416,664., Cl. 604-174.000.
Wood, Charles D., to Southwest Research Institute. Fuel injection system for diesel engines. 4,416,229., Cl. 123-304.000.
Wood, Dennis: *See*—
Bellis, Robert D.; and Wood, Dennis, 4,416,364., Cl. 194-100.00A.
Wood, Douglas E.; Kooy, Wayne J.; and Unger, Lawrence C., to Printek, Inc. Computer printer carriage control apparatus including an encoding disk. 4,416,560., Cl. 400-705.100.
Woodhouse, Christopher R. J., to Sandoz Ltd. Organic compounds. 4,416,894., Cl. 424-273.00R.
Woods, Donald C., to Del Mar Avionics. Validator for electrocardial data processing system. 4,417,254., Cl. 346-33.00R.
Woodstream Corporation: *See*—
Askins, William E., 4,416,081., Cl. 43-90.000.
Worcester Controls Corporation: *See*—
Cronin, Gerald F.; and Fuller, Howard J., 4,417,312., Cl. 364-510.000.
Worthington, Paul A., to Imperial Chemical Industries PLC. 1,3-Bis-(azolyl)propanols as fungicides and plant growth regulators. 4,416,682., Cl. 71-76.000.
Wren, Fred W.: *See*—
Wilkinson, Harlen E.; and Wren, Fred W., 4,416,389., Cl. 220-269.000.
Wright, John F.: *See*—
Sandhu, M. Akram; Wright, John F.; and Molaire, Michel F., 4,416,965., Cl. 430-109.000.
Wright, Richard F.: *See*—
Sanders, Frederick W.; Wright, Richard F.; and Adair, Paul C., 4,416,966., Cl. 430-138.000.
Wright, Stuart C.; Adams, Don L.; Fischer, William C.; and Verzella, David J., to United Technologies Corporation. Dual inner loop fault inhibit of aircraft outer loop. 4,417,308., Cl. 364-434.000.
Wyman, Ransome J. Deflation-proof pneumatic tire and elastomeric fillings therefore. 4,416,844., Cl. 264-267.000.
Xerox Corporation: *See*—
Ceasar, Gerald P.; and Grimshaw, Scott F., 4,416,755., Cl. 204-192.00S.
Gundlach, Robert W., 4,416,537., Cl. 355-15.000.
Kluger, Jacob N., 4,416,534., Cl. 355-14.0SH.
Stokes, Ronald E., 4,416,046., Cl. 29-417.000.
Yagihara, Morio: *See*—
Morigaki, Masakazu; Yagihara, Morio; and Ozawa, Takashi, 4,416,978., Cl. 430-548.000.
Yakovis, Leonid M.: *See*—
Gelfand, Yakov E.; Komova, Marina L.; Shtengel, Eduard G.; and Yakovis, Leonid M., 4,416,394., Cl. 222-55.000.
Yamada, Haruyasu: *See*—
Inoue, Michihiro; Takemoto, Toyoki; and Yamada, Haruyasu, 4,417,233., Cl. 340-347.0AD.
Yamada Kikai Kogyo Kabushiki Kaisha: *See*—
Yamada, Masatoshi; and Fuse, Takaji, 4,416,196., Cl. 100-7.000.
Yamada, Masatoshi; and Fuse, Takaji, to Yamada Kikai Kogyo Kabushiki Kaisha. Tying machine. 4,416,196., Cl. 100-7.000.
Yamada, Teruo, to Fuji Manufacturing Company Limited. Clamping mechanism for impulse sealer. 4,416,104., Cl. 53-371.000.
Yamaguchi, Tomonobu: *See*—
Enomoto, Shogo; Sawai, Masanobu; Seo, Iwao; and Yamaguchi, Tomonobu, 4,416,269., Cl. 128-41.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Fukui, Takumi, 4,416,348., Cl. 180-210.000.
Yamakage, Tetsuro; and Takashima, Toshiharu, to Toyoda Koki Kabushiki Kaisha. Tool position compensating mechanism. 4,416,569., Cl. 408-4.000.
Yamamoto, Kazuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Document information filing system. 4,417,282., Cl. 358-296.000.
Yamamoto, Minoru: *See*—
Touhou, Makoto; Wada, Shigeaki; and Yamamoto, Minoru, 4,417,172., Cl. 313-156.000.
Yamamoto, Noboru; Morikubo, Keiichi; Komatsu, Minato; and Sei, Kazuo, to TOA Nenryo Kogyo Kabushiki Kaisha. Polyolefin molding composition containing carboxylic acid-modified polyolefin, glass fibers and calcium-silicate useful for welding. 4,417,019., Cl. 524-456.000.
Yamamoto, Seiji, to Nikko Co., Ltd. Water-cooled lid made of steel tubing for electric furnace. 4,417,343., Cl. 373-73.000.
Yamamoto, Takaaki: *See*—
Kawai, Yasuhiro; Okamoto, Yosnihiko; Yamamoto, Takaaki; and Kato, Hisatoyo, 4,417,260., Cl. 346-160.000.
Yamamoto, Yasunobu: *See*—
Suzuki, Kiyohisa; Yamamoto, Yasunobu; Tomikawa, Ryoichi; Sakabe, Toshiaki; Ban, Hiroshi; and Ishida, Nobuyasu, 4,416,361., Cl. 192-107.00M.
Yamanaka, Chiyoe; Kato, Yoshiaki; Yoshida, Kunio; and Yoshida, Eiji, to Osaka University, The President of. Glass laser amplifier having a number of trigger members. 4,417,341., Cl. 372-72.000.
Yamashita, Mitsuo: *See*—
Takaoka, Takashi; Mochizuki, Masahiko; Yamashita, Mitsuo; and Miura, Tadao, 4,417,331., Cl. 369-111.000.
Yamata Scale Company, Ltd.: *See*—
Hirano, Takashi, 4,416,341., Cl. 177-25.000.
Yamato, Noboru; Hasegawa, Akira; and Shimizu, Ippei, to Jujo Paper Co., Ltd. Color-developing sheet for pressure-sensitive recording sheet. 4,416,471., Cl. 282-27.500.
Yanagihara, Takeshi: *See*—
Matsuda, Tsutomu; Hirabayashi, Takeo; Yanagihara, Takeshi; and Sakurai, Shinjiro, 4,416,967., Cl. 430-159.000.
Yanagisawa, Hifumi; Warabi, Junichi; and Sakuma, Shinzo, to Kabushiki Kaisha Meidensha. Vacuum interrupter. 4,417,110., Cl. 200-144.00B.
Yano, Kiyotosi: *See*—
Naito, Mitikatu; Yano, Kiyotosi; and Itou, Kazuo, 4,416,243., Cl. 123-569.000.
Yasui, Bompei: *See*—
Fujii, Setsuro; Yasui, Bompei; Nakamura, Mitsuo; Miyamoto, Tomohisa; Ando, Kazuko; Hashimoto, Iwao; Sawai, Yoneichi; Umeda, Naoki; and Kawasaki, Masahiro, 4,416,875., Cl. 424-180.000.
Yates, Alan K.: *See*—
Cooper, Albert A.; El-Rayes, Mohamed; and Yates, Alan K., 4,416,281., Cl. 128-400.000.
Yates, Mark A.: *See*—
Desmarais, Mark R.; and Yates, Mark A., 4,417,115., Cl. 200-340.000.
Yazaki, Mitsuyoshi: *See*—
Magari, Teruo; Yazaki, Mitsuyoshi; and Nakamura, Masayoshi, 4,416,809., Cl. 252-557.000.
Yee, Dennis S.: *See*—
Cuomo, Jerome J.; Leary, Pamela A.; and Yee, Dennis S., 4,416,725., Cl. 156-635.000.
Yen, Huan-Wun: *See*—
Figueroa, Luis; and Yen, Huan-Wun, 4,416,053., Cl. 29-572.000.
Ylilammi, Markku A.: *See*—
Antson, Jorma O.; Lindfors, Sven G.; Pakkala, Arto J.; Skarp, Jarmo I.; Suntola, Tuomo S.; and Ylilammi, Markku A., 4,416,933., Cl. 428-216.000.
Yoda, Kuniichi; and Ohkawa, Takehisa, to TDK Electronics Co. Ltd. Magnetic recording medium. 4,416,947., Cl. 428-447.000.
Yoda, Kuniichi: *See*—
Ohkawa, Takehisa; and Yoda, Kuniichi, 4,416,948., Cl. 428-447.000.
Yokohama Rubber Co., Ltd., The: *See*—
Tokieda, Akinori; and Takasugi, Sumio, 4,417,005., Cl. 523-351.000.
Yokomichi, Isao: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Nishimura, Shigeyuki, 4,417,055., Cl. 546-345.000.
Yokote, Yasuharu: *See*—
Tsuda, Mitsuru; Miike, Akira; Shimizu, Yoshiaki; Yokote, Yasuharu; and Tatano, Toshio, 4,416,982., Cl. 435-11.000.
Yokouchi, Hiroyuki: *See*—
Oyama, Kohei; and Yokouchi, Hiroyuki, 4,417,297., Cl. 361-412.000.
Yokoyama, Tsuneo; and Tsuchiya, Kazumichi, to Fuji Photo Optical Co., Ltd. Servo amplifier for television camera lens. 4,417,280., Cl. 358-227.000.
Yon, William S., to Sonoco Products Company. Paper feed mechanism for rotary die cutter. 4,416,200., Cl. 101-228.000.
Yono, Munim; and Dolin, Russell L. Spray assembly for refrigerated display cases. 4,416,120., Cl. 62-231.000.
Yorgiadis, Alexander. Strain gage load cell insensitive to external pressure. 4,416,163., Cl. 73-862.650.
Yoshida, Eiji: *See*—
Yamanaka, Chiyoe; Kato, Yoshiaki; Yoshida, Kunio; and Yoshida, Eiji, 4,417,341., Cl. 372-72.000.
Yoshida, Hideaki: *See*—
Morikawa, Masaki; Yoshida, Hideaki; Kishida, Kunio; and Tanaka, Chuji, 4,416,853., Cl. 420-469.000.
Yoshida, Hiroshi: *See*—
Izumi, Masao; and Yoshida, Hiroshi, 4,416,192., Cl. 98-40.00N.
Yoshida Kogeisha: *See*—
Yoshida, Takashi, 4,416,247., Cl. 124-79.000.
Yoshida Kogyo K. K.: *See*—
Nakagawa, Toshiaki, 4,416,060., Cl. 29-767.000.

Yoshida, Kunio: *See*—
Morimoto, Masafumi; Yoshida, Kunio; and Nakanishi, Tosaku, 4,417,319., Cl. 364-900.000.
Yamanaka, Chiyoe; Kato, Yoshiaki; Yoshida, Kunio; and Yoshida, Eiji, 4,417,341., Cl. 372-72.000.

Yoshida, Takashi, to Yoshida Kogeisha. Domino toppling toy. 4,416,247., Cl. 124-79.000.

Yoshimura, Noriaki; and Tamura, Masuhiko, to Kuraray Company, Limited. Process for producing normal-octanol. 4,417,079., Cl. 568-903.000.

Young, Russell D., to Creative Pathways, Incorporated. Power source for arc welder. 4,417,129., Cl. 219-130.320.

Yugen-Kaisha Wakatake Giken: *See*—
Wakatake, Masayuki, 4,417,241., Cl. 340-815.050.

Yui, Tomoyuki: *See*—
Sugano, Junichiro; Kobayashi, Shuichi; Yui, Tomoyuki; Fujimoto, Tsuneo; and Kubota, Minoru, 4,416,606., Cl. 425-202.000.

Zagar, Steven J.; and Shy, James L., to Allis-Chalmers Corporation. Method for heat treating cement clinker raw materials. 4,416,696., Cl. 106-100.000.

Zagar, Steven J.; and Shy, James L., to Allis-Chalmers Corporation. Method for preheating cement clinker raw materials. 4,416,697., Cl. 106-100.000.

Zahnradfabrik Friedrichshafen, AG.: *See*—
Merz, Johann, 4,416,598., Cl. 418-132.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Naganawa, Hiroshi; Iinuma, Hironobu; and Kunimoto, Setsuko, 4,416,899., Cl. 424-320.000.

Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
Nishizawa, Jun-ichi; and Shiota, Ikuo, 4,416,952., Cl. 428-698.000.

Zampino, Michael J.: *See*—
Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; and Zampino, Michael J., 4,416,902., Cl. 426-3.000.

Zaromb, Solomon. Power generation apparatus. 4,416,954., Cl. 429-15.000.

Zatulovsky, Lev M.: *See*—
Pelts, Boris B.; Tumasian, Beniamin A.; Egorov, Leonid P.; Zatulovsky, Lev M.; Chaikin, Peter M.; Freiman, Efim A.; Chalian, Eduard A.; Abramian, Grant I.; Azoian, Stepan E.; and Kostandian, Kliment A., 4,416,723., Cl. 156-608.000.

Zdanowicz, Lawrence E.: *See*—
Kashmerick, Gerald E.; and Zdanowicz, Lawrence E., 4,416,637., Cl. 440-60.000.

Zeis, Jurgen, to Licentia Patent-Verwaltungs GmbH. Amplitude modulated transmitter for single sideband operation. 4,417,358., Cl. 455-109.000.

Zemke, Edward H.; Guenther, Kenneth L.; and Baethke, Friedrich W., to Bell & Howell Company. Shaft coupling device. 4,416,563., Cl. 403-14.000.

Zen, Giuseppe. Protective device. 4,416,084., Cl. 49-50.000.

Zenith, Bernard L., to Sterling Drug Inc. Phenyl-lower-alkyl piperidines and pyrrolidines. 4,417,052., Cl. 546-246.000.

Zeno, John R.: *See*—
Goodman, Mark; Zeno, John R.; and Borruso, Marty, 4,416,145., Cl. 73-40.50A.

Zetterqvist, Stig B. H.: *See*—
Carre, Olof G.; Josefsson, Paul W.; Nasman, Lars E.; and Zetterqvist, Stig B. H., 4,416,548., Cl. 366-168.000.

Ziegler, Walter: *See*—
Oeder, Dieter; Dietsche, Wolfram; Weiss, Stefan; Ziegler, Walter; Kueppers, Peter; and Hettche, Albert, 4,417,035., Cl. 526-208.000.

Zimmerly, Harry L., to Halkey-Roberts Corporation. Inflator guard. 4,416,393., Cl. 222-5.000.

Zink, Leonard: *See*—
Braverman, Milton; and Zink, Leonard, 4,416,375., Cl. 206-534.100.

Ziphron, Inc.: *See*—
Parr, Erwin W.; and Brandt, Timothy B., 4,416,399., Cl. 222-402.130.

Zivny, Joseph C. Flue damper control. 4,416,611., Cl. 431-20.000.

Zscheile, John W., Jr., to Sperry Corporation. Phase weighted adaptive processor. 4,417,249., Cl. 343-379.000.

Zumbach Electronic AG: *See*—
Studer, Urs P., 4,416,541., Cl. 356-386.000.

Zuzinec, Raymond R.: *See*—
Nelson, James W.; Zuzinec, Raymond R.; and Foster, Michael L., 4,416,338., Cl. 173-134.000.

Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, to Ciba-Geigy Corporation. Tricyclic imidyl derivatives. 4,417,058., Cl. 548-451.000.

Zweifel, Hans: *See*—
Green, George E.; Losert, Ewald; Paul, John G.; and Zweifel, Hans, 4,416,975., Cl. 430-327.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF NOVEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kawasaki, Masahiro, Re. 31,446., Cl. 354-33.000.

Attwood, Terence E.; and Farrant, Barry W., to Imperial Chemical Industries, Ltd. Coating compositions comprising a polysulfone and fluorocarbon polymer. Re. 31,448., Cl. 428-422.000.

Baney, Ronald H.; and Gaul, John H., Jr., to Dow Corning Corporation. High yield silicon carbide pre-ceramic polymers. Re. 31,447., Cl. 264-65.000.

Carter, James C., to ITT. Submerged pumping system. Re. 31,445., Cl. 222-333.000.

Crider, William A. Fluid-driven rotary engine. Re. 31,449., Cl. 280-43.000.

Dow Corning Corporation: *See*—
Baney, Ronald H.; and Gaul, John H., Jr., Re. 31,447., Cl. 264-65.000.

Farrant, Barry W.: *See*—
Attwood, Terence E.; and Farrant, Barry W., Re. 31,448., Cl. 428-422.000.

Gaul, John H., Jr.: *See*—
Baney, Ronald H.; and Gaul, John H., Jr., Re. 31,447., Cl. 264-65.000.

Imperial Chemical Industries, Ltd.: *See*—
Attwood, Terence E.; and Farrant, Barry W., Re. 31,448., Cl. 428-422.000.

ITT: *See*—
Carter, James C., Re. 31,445., Cl. 222-333.000.

Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Manual or automatic camera and electronic flash for use therewith. Re. 31,446., Cl. 354-33.000.

LIST OF REEXAM PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Fletcher, Edwin H., to United States Freight Company. Selectively connectable boat and barge. B1 3,512,495., 11-22-83, Cl. 114-248.000.

Mitsubishi Paper Mills, Ltd.: *See*—
Yoshida, Akio; Tanaka, Akira; and Tsubai, Yasuo, B1 4,134,769., Cl. 430-199.000.

Pacific Scientific Company: *See*—
Yang, Elmer C., B1 1,029,221., Cl. 188-378.000.

Tanaka, Akira: *See*—
Yoshida, Akio; Tanaka, Akira; and Tsubai, Yasuo, B1 4,134,769., Cl. 430-199.000.

Tsubai, Yasuo: *See*—
Yoshida, Akio; Tanaka, Akira; and Tsubai, Yasuo, B1 4,134,769., Cl. 430-199.000.

United States Freight Company: *See*—
Fletcher, Edwin H., B1 3,512,495., Cl. 114-248.000.

Yang, Elmer C., to Pacific Scientific Company. Acceleration sensitive motion snubber. B1 1,029,221., 11-22-83, Cl. 188-378.000.

Yoshida, Akio; Tanaka, Akira; and Tsubai, Yasuo, to Mitsubishi Paper Mills, Ltd. Offset printing plate. B1 4,134,769., 11-22-83, Cl. 430-199.000.

LIST OF DESIGN PATENTEES

Aktiebolaget Bofors: *See*—
Larsson, Torsten; and Johansson, Arne, 271,495., Cl. D15-29.000.

American Home Products Corporation: *See*—
Cassini, Oleg L., 271,460., Cl. D7-137.000.
Cassini, Oleg L., 271,461., Cl. D7-150.000.

American Standard Inc.: *See*—
DeGraw, Kenneth J.; and Nickerson, Earl W., 271,515., Cl. D23-48.000.

Anthos S.A.: *See*—
Bulgari, Giovanni, 271,471., Cl. D10-32.000.

Ashbourne Development Corporation: *See*—
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Boissonnet, Michel, to S.A.R.L. Wichard. Safety hook. 271,466., 11-22-83, Cl. D8-367.000.

Brantingham, Mark L. Toy rocking horse. 271,503., 11-22-83, Cl. D21-75.000.

Breger, Carl-Arne, to Telefonaktiebolaget L M Ericsson. Telephone instrument. 271,487., 11-22-83, Cl. D14-53.000.

Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., to Simmons Universal Corporation. Crib footboard. 271,456., 11-22-83, Cl. D6-198.000.

Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., to Simmons Universal Corporation. Crib footboard. 271,457., 11-22-83, Cl. D6-198.000.

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Burns, Marjorie L., to Steck-Vaughn Company. Printed type font. 271,499., 11-22-83, Cl. D18-28.000.

Byrne, David S., to Warner-Lambert Company. Disposable razor with sliding cap. 271,531., 11-22-83, Cl. D28-46.000.

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Cassini, Oleg L., to American Home Products Corporation. Fork or similar article. 271,461., 11-22-83, Cl. D7-150.000.

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Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum named Treasure. 5,144., 11-22-83, Cl. 78.000.

CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

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11.3 4,416,107
17.5 4,416,108
209 4,416,109

CLASS 57

22 4,416,110

CLASS 60

39.29 4,416,111
251 4,416,112
513 4,416,113
526 4,416,114
600 4,416,115
641.8 4,416,116
650 4,416,117

CLASS 62

13 4,416,677
66 4,416,118
149 4,416,119
231 4,416,120
238.6 4,416,121
448 4,416,122

CLASS 65

2 4,416,678
118 4,416,679
144 4,416,680
264 4,416,681

CLASS 68

5 E 4,416,123
9 4,416,124

CLASS 69

21 4,416,125

CLASS 70

71 4,416,126
276 4,416,127
364 A 4,416,128
369 4,416,129

CLASS 71

76 4,416,682
90 4,416,683
95 4,416,684
4,416,685
105 4,416,686
109 4,416,687

CLASS 72

10 4,416,130
12 4,416,131
41 4,416,132
58 4,416,133
68 4,416,134
130 4,416,135
157 4,416,136
243 4,416,137
263 4,416,138
267 4,416,139
345 4,416,140
4,416,141
348 4,416,142
479 4,416,143

CLASS 73

12 4,416,144
40.5 A 4,416,145
49.5 4,416,146
49.6 4,416,147
64.4 4,416,148
118 4,416,149
119 A 4,416,150
152 4,416,151
155 4,416,152
295 4,416,153
571 4,416,154
646 4,416,155
727 4,416,156
747 4,416,157
842 4,416,158
861.22 4,416,159
862.17 4,416,160
862.36 4,416,161
862.62 4,416,162
862.65 4,416,163

CLASS 74

10.33 4,416,164
70 4,416,165
551.9 4,416,166
650 4,416,167
740 4,416,168

CLASS 75

6 4,416,688
11 4,416,689
26 4,416,690
60 4,416,691
63 4,416,692
101 R 4,416,693

CLASS 76

25 A 4,416,169
107 R 4,416,170

CLASS 81

3.46 R 4,416,171
57.37 4,416,172
185 4,416,173

CLASS 82

38 R 4,416,174

CLASS 83

29 4,416,175
582 4,416,176

CLASS 84

1.19 4,416,177
4,416,178
4,416,179
1.23 4,416,180
272 4,416,181
470 R 4,416,182

CLASS 89

1.807 4,416,183
33 BB 4,416,184
33 SF 4,416,185
198 4,416,186

CLASS 91

361 4,416,187
369 B 4,416,188
421 4,416,189

CLASS 92

71 4,416,190
165 PR 4,416,191

CLASS 98

40 N 4,416,192
115 SB 4,416,193

CLASS 99

275 4,416,194
544 4,416,195

CLASS 100

7 4,416,196
214 4,416,197

CLASS 101

3 R 4,416,198
193 4,416,199
228 4,416,200
348 4,416,201

CLASS 104

88 4,416,202

CLASS 105

224.1 4,416,203

CLASS 106

84 4,416,694
90 4,416,695
100 4,416,696
4,416,697
163 R 4,416,698
300 4,416,699

CLASS 112

68 4,416,204
79 R 4,416,205
158 B 4,416,206
178 4,416,207
240 4,416,208
266.1 4,416,209

CLASS 114

67 A 4,416,210
248 B1 3,512,495

CLASS 116

204 4,416,211
210 4,416,212

CLASS 118

52 4,416,213
410 4,416,214
642 4,416,215
696 4,416,216
4,416,217

CLASS 119

18 4,416,218
48 4,416,219
51.11 4,416,220
72.5 4,416,221

CLASS 122

13 R 4,416,222
367 C 4,416,223

CLASS 123

3 4,416,224
25 E 4,416,225
143 B 4,416,226
198 D 4,416,227
268 4,416,228
304 4,416,229
325 4,416,230
327 4,416,231
357 4,416,232
383 4,416,233
424 4,416,234
425 4,416,235
438 4,416,236
4,416,237
470 4,416,238
478 4,416,239
490 4,417,201
493 4,416,240
494 4,416,241
549 4,416,242
569 4,416,243
577 4,416,244
613 4,416,245
618 4,416,246

CLASS 124

79 4,416,247

CLASS 126

9 B 4,416,248
41 R 4,416,249
146 4,416,250
201 4,416,251
242 4,416,252
292 4,416,253
307 A 4,416,254
422 4,416,255
427 4,416,256
4,416,257
428 4,416,258
429 4,416,259
4,416,260
433 4,416,261
438 4,416,262
4,416,263
442 4,416,264
446 4,416,265

CLASS 127

34 4,416,700
68 4,416,701

CLASS 128

1 R 4,416,267
6 4,416,268
41 4,416,269
53 4,416,270
57 4,416,271
96 4,416,272
207.16 4,416,273
303 A 4,416,275
303.13 4,416,276
4,416,277
305 4,416,278
314 4,416,279
325 4,416,266
399 4,416,280
400 4,416,281
419 PG 4,416,282
4,416,283
425 4,416,284
634 4,416,285
663 4,416,286
685 4,416,287
731 4,416,288
737 4,416,289
764 4,416,290
766 4,416,291
779 4,416,292
782 4,416,293

CLASS 130

30 R 4,416,294

CLASS 131

364 4,416,295

CLASS 132

7 4,416,296
4,416,297
33 R 4,416,298

CLASS 133

1 R 4,416,299

CLASS 134

6 4,416,702
8 4,416,703
34 4,416,704
108 4,416,300

CLASS 136

258 4,417,092

CLASS 137

220 4,416,301
315 4,416,302
576 4,416,303
596.13 4,416,304
614 4,416,305
615 4,416,306
625.66 4,416,307
846 4,416,308

CLASS 138

104 4,416,309

CLASS 139

59 4,416,310

CLASS 144

3 D 4,416,311
39 4,416,312
193 R 4,416,313

CLASS 145

33 R 4,416,314

CLASS 148

6.15 Z 4,416,705
11.5 C 4,416,706
111 4,416,707
187 4,416,708
403 4,416,709

CLASS 149

19.91 4,416,710
42 4,416,711
98 4,416,712

CLASS 150

47 4,416,315

CLASS 152

209 R 4,416,316
4,416,317
213 A 4,416,318
213 R 4,416,319

CLASS 156

64 4,416,713
86 4,416,714
210 4,416,715
242 4,416,717
245 4,416,716
344 4,416,718
359 4,416,719
401 4,416,720
428 4,416,721
578 4,416,722
608 4,416,723
628 4,416,724
635 4,416,725
643 4,416,726

CLASS 160

177 4,416,320

CLASS 162

6 4,416,727
159 4,416,728
164.3 4,416,729
264 4,416,730
308 4,416,731

CLASS 164

80 4,416,321
340 4,416,322

CLASS 165

11 R 4,416,323
12 4,416,324
47 4,416,325
120 4,416,326
122 4,416,327

CLASS 166

65 R 4,416,328
68 4,416,329
117.5 4,416,330
236 4,416,331
246 4,416,332
250 4,416,333

CLASS 171

27 4,416,334

CLASS 172

2 4,416,335
386 4,416,336

CLASS 173

57 4,416,337
134 4,416,338

CLASS 174

25 R 4,417,093
28 4,417,094
52 FP 4,417,095
71 R 4,417,096
110 A 4,417,097

CLASS 175

61 4,416,339
195 4,416,340

CLASS 177

25 4,416,341
163 4,416,342
180 4,416,343

CLASS 179

2 DP 4,417,099
5 R 4,417,100
8 R 4,417,101
107 R 4,417,104

CLASS 180

8 R 4,416,344
79.1 4,416,345
119 4,416,346
197 4,416,347
210 4,416,348

CLASS 181

208 4,416,349
272 4,416,350

CLASS 182

238 4,416,351

CLASS 187

29 R 4,416,352

CLASS 188

2 A 4,416,353
166 4,416,354
185 4,416,355
326 4,416,356
378 B1 Re.29,221

CLASS 191

23 A 4,416,357

CLASS 192

0.076 4,416,360
3.32 4,416,358
54 4,416,359
107 M 4,416,361

CLASS 193

25 C 4,416,362

CLASS 194

4 D 4,416,363
100 A 4,416,364
4,416,365

CLASS 198

320 4,416,366
496 4,416,367
604 4,416,368

CLASS 200

5 A 4,417,105
5 R 4,417,106
16 C 4,417,107
50 AA 4,417,108
68 4,417,109
144 B 4,417,110
146 R 4,417,112
148 R 4,417,111
302 4,417,113
317 4,417,114
340 4,417,115

CLASS 202

139 4,416,732
228 4,416,733

CLASS 203

18 4,416,734

CLASS 204

1 T 4,416,735
4,416,736
28 4,416,737
32 R 4,416,738
4,416,739
43 N 4,416,740
4,416,741
47 4,416,742
59 R 4,416,743
95 4,416,744
112 4,416,745
114 4,416,746
129 4,416,747
157.1 P 4,416,748
159.14 4,416,749
159.19 4,416,750
165 4,416,751
181 C 4,416,753
181 R 4,416,752
190 4,416,754
192 S 4,416,755
206 4,416,756
252 4,416,757
258 4,416,758
298 4,416,759
4,416,760
299 R 4,416,761
4,416,762
412 4,416,763

CLASS 206

45.29 4,416,369
217 4,416,370
289 4,416,371
372 4,416,372
432 4,416,373
507 4,416,374
534.1 4,416,375
554 4,416,376
602 4,416,377

CLASS 208

11 LE 4,416,764
120 4,416,765
135 4,416,766
262 4,416,767

CLASS 209

3 4,416,768
166 4,416,769
167 4,416,770
224 4,416,771
583 4,416,378

CLASS 210

137 4,416,772
236 4,416,774
4,416,775
238 4,416,776
289 4,416,773
446 4,416,777
516 4,416,778
603 4,416,779
617 4,416,780
629 4,416,781
634 4,416,782
635 4,416,783
4,416,784
699 4,416,785
746 4,416,786

CLASS 211

19 4,416,379
49 D 4,416,380

CLASS 215

228 4,416,381
231 4,416,382
256 4,416,383

CLASS 219

10.55 A 4,417,116
64 4,417,117
69 W 4,417,118
72 4,417,119
96 4,417,120
104 4,417,121
108 4,417,122
121 LH 4,417,123
4,417,124
121 LY 4,417,125
124.22 4,417,126
124.34 4,417,127
125.12 4,417,128
130.32 4,417,129
130.51 4,417,130
279 4,417,131
291 4,417,132
316 4,417,133

CLASS 220

1.5 4,416,384
4,416,385
67 4,416,386
93 4,416,387
207 4,416,388
269 4,416,389
273 4,416,390
304 4,416,391

CLASS 221

45 4,416,392

CLASS 222

5 4,416,393
55 4,416,394
83 4,416,395
129 4,416,396
219 4,416,397
333 Re.31,445
402.13 4,416,398
4,416,399
420 4,416,400

CLASS 223

88 4,416,401

CLASS 224

42.24 4,416,402
161 4,416,403
224 4,416,404
257 4,416,405
314 4,416,406

CLASS 227

67 4,416,407

CLASS 228

19 4,416,408
173 R 4,416,409

CLASS 229

38 4,416,410
40 4,416,411
41 R 4,416,412

CLASS 232

24 4,416,413
39 4,416,414

CLASS 235

61 L 4,417,134
379 4,417,136
4,417,137
492 4,417,138

CLASS 236

49 4,416,415
86 4,416,416
92 R 4,416,417

CLASS 237

19 4,416,418

CLASS 238

89 4,416,419

CLASS 239

22 4,416,420
79 4,416,421
455 4,416,422
585 4,416,423

CLASS 241

101 B 4,416,424

CLASS 242

55.2 4,416,425
56.9 4,416,426
84.2 R 4,416,427
84.21 R 4,416,428
86.5 A 4,416,429
107.3 4,416,430
151 4,416,431
199 4,416,432

CLASS 244

33 4,416,433
35 R 4,416,434
114 R 4,416,435
137 R 4,416,436
4,416,437

CLASS 248

102 4,416,438
188.6 4,416,439

CLASS 249

82 4,416,440

CLASS 250

204 4,417,139
227 4,417,140
231 SE 4,417,141
253 4,417,142
363 S 4,417,143
367 4,417,144
396 ML 4,417,145
516.1 4,417,146
560 4,417,147
561 4,417,148
563 4,417,149
572 4,417,150

CLASS 251

1 A 4,416,441

CLASS 252

8.75 4,416,811
8.8 4,416,787
31 4,416,788
34.7 4,416,789
62 4,416,790
90 4,416,791
110 4,416,792
117 4,416,793
174.15 4,416,794
301.23 4,416,795
338 4,416,796
400 A 4,416,797
511 4,416,807
547 4,416,808
557 4,416,809
628 4,416,810

CLASS 260

112 R 4,416,812
117 4,416,813
4,416,814
145 A 4,416,815
151 4,416,816
239 A 4,416,817
239.3 A 4,416,818
293.3 B 4,416,819
397.1 4,416,821
397.4 4,416,822
410.9 R 4,416,823
439 R 4,416,824
4,416,825
453 RZ 4,416,826
501.12 4,416,827
4,416,828
927 R 4,416,829
929 4,416,830
938 4,416,831
940 4,416,832
941 4,416,833
979 4,416,834

CLASS 261

110 4,416,835
112 4,416,836

CLASS 264

2.1 4,416,837
25 4,416,838
49 4,416,839
60 4,416,840
65 Re.31,447
102 4,416,841
145 4,416,842
152 4,416,843
267 4,416,844

CLASS 266

44 4,416,442
47 4,416,443
48 4,416,444

CLASS 267

35 4,416,445
140.3 4,416,446

CLASS 270

54 4,416,447
55 4,416,448

CLASS 271

122 4,416,449
303 4,416,450

CLASS 272

116 4,416,451

CLASS 273

63 A 4,416,452
155 4,416,453
243 4,416,454
272 4,416,455
359 4,416,456

CLASS 277

53 4,416,457
96.1 4,416,458

CLASS 279

2 R 4,416,459

CLASS 280

3 4,416,460
5 A 4,416,461
33.99 B 4,416,462
79.3 4,416,463
215 4,416,464
290 4,416,465
477 4,416,466
512 4,416,467
802 4,416,468
804 4,416,469

CLASS 281

7 4,416,470

CLASS 282

27.5 4,416,471

CLASS 285

3 4,416,472
41 4,416,473
47 4,416,474
229 4,416,475
286 4,416,476

CLASS 290

43 Re.31,449

CLASS 292

19 4,416,477
307 R 4,416,478

CLASS 294

1 B 4,416,479
83 R 4,416,480
87.2 4,416,481

CLASS 296

3 4,416,482
37.1 4,416,483
43 4,416,484
188 4,416,485
190 4,416,486
222 4,416,487

CLASS 297

411 4,416,488

CLASS 299

94 4,416,489

CLASS 303

6 C 4,416,490
113 4,416,491

CLASS 307

24 4,417,151
64 4,417,152
140 4,417,153
202.1 4,417,154
247 A 4,417,155
252 C 4,417,156
256 4,417,157
269 4,417,158
270 4,417,159
353 4,417,160
471 4,417,161
473 4,417,162
475 4,417,163
497 4,417,164
540 4,417,165

CLASS 308

203 4,416,492

CLASS 310

49 R 4,417,166
67 R 4,417,167
156 4,417,168
317 4,417,169
345 4,417,170

CLASS 312

245 4,416,493

CLASS 313

16 4,417,171
156 4,417,172
346 R 4,417,173
502 4,417,174

CLASS 315

5.38 4,417,175
59 4,417,176
73 4,417,177
111.81 4,417,178
151 4,417,179
175 4,417,180
209 R 4,417,181
210 4,417,182
291 4,417,183
366 4,417,184

CLASS 318

2 4,417,185
254 4,417,186
331 4,417,187
696 4,417,188
4,417,189
729 4,417,190
760 4,417,191
797 4,417,192
803 4,417,193

CLASS 322

47 4,417,194
58 4,417,195

CLASS 323

210 4,417,196
272 4,417,197
315 4,417,198
319 4,417,199
347 4,417,200

CLASS 324

51 4,417,202
4,417,203
73 PC 4,417,204
133 4,417,205
158 P 4,417,206
158 R 4,417,207
164 4,417,208
309 4,417,209
336 4,417,210
392 4,417,211
439 4,417,212

CLASS 328

164 4,417,213

CLASS 330

84 4,417,214
107 4,417,215
294 4,417,216

CLASS 331

66 4,417,217
178 4,417,218

CLASS 332

9 R 4,417,219

CLASS 333

174 4,417,220
194 4,417,221

CLASS 335

6 4,417,222
195 4,417,223

CLASS 337

164 4,417,224
198 4,417,225
273 4,417,226

CLASS 338

21 4,417,227
34 4,417,228

CLASS 339

15 4,416,494
16 C 4,416,495
17 C 4,416,496
17 F 4,416,497
60 R 4,416,498
92 M 4,416,499
95 D 4,416,500
97 R 4,416,501
103 M 4,416,502
220 R 4,416,503
252 P 4,416,504

CLASS 340

47 4,417,229
52 F 4,417,231
52 R 4,417,230
59 4,417,232
347 AD 4,417,233
4,417,234
531 4,417,235
626 4,417,236
686 4,417,237
688 4,417,238
709 4,417,239
782 4,417,240
815.05 4,417,241
825.05 4,417,242
4,417,243
825.31 4,417,247
825.44 4,417,246
825.8 4,417,244
4,417,245

CLASS 343

16 M 4,417,248
379 4,417,249
405 4,417,250

CLASS 346

1.1 4,417,251
4,417,252
17 4,417,253
33 R 4,417,254
75 4,417,255
4,417,256
76 PH 4,417,257
139 R 4,417,258
140 R 4,417,259
160 4,417,260

CLASS 350

3.69 4,416,540
3.71 4,416,505
96.21 4,416,506
96.22 4,416,507
96.23 4,416,508
102 4,416,509
106 4,416,510
117 4,416,511
171 4,416,512
255 4,416,513
335 4,416,514
350 F 4,416,515
357 4,416,516
4,416,517
427 4,416,518
475 4,416,519

CLASS 353

101 4,416,520

CLASS 354

1 4,416,521
4 4,416,522
25 4,416,523
31 4,416,524
33 Re.31,446
173 4,416,525
198 4,416,526
272 4,416,527
296 4,416,528
320 4,416,529

CLASS 355

3 BE 4,416,532
3 R 4,416,530

3 TR 4,416,531
4 4,416,533
14 D 4,416,535
14 R 4,416,536
14 SH 4,416,534
15 4,416,537
67 4,416,538
77 4,416,539

CLASS 356

386 4,416,541
435 4,416,542

CLASS 357

3 4,417,261
17 4,417,262
23 4,417,263
4,417,264
51 4,417,265
80 4,417,266
81 4,417,267

CLASS 358

10 4,417,268
12 4,417,269
23 4,417,270
24 4,417,271
44 4,417,272
60 4,417,273
107 4,417,274
139 4,417,275
160 4,417,276
177 4,417,277
188 4,417,278
195.1 4,417,279
227 4,417,280
287 4,417,281
296 4,417,282
310 4,417,283
316 4,417,284
342 4,417,285

CLASS 360

51 4,417,286
71 4,417,287
74.1 4,417,288
98 4,417,289
131 4,417,290
133 4,417,291

CLASS 361

87 4,417,292
212 4,417,293
288 4,417,294
384 4,417,295
386 4,417,296
412 4,417,297
433 4,417,298

CLASS 362

186 4,417,299
304 4,417,300

CLASS 363

129 4,417,301

CLASS 364

200 4,417,302
4,417,303
4,417,304
300 4,417,305
415 4,417,306
424.1 4,417,307
434 4,417,308
450 4,417,309
481 4,417,310
501 4,417,311
510 4,417,312
513 4,417,102
524 4,417,313
716 4,417,314
770 4,417,315
4,417,316
825 4,417,317
900 4,417,318
4,417,319
4,417,320
4,417,321
4,417,322

CLASS 365

1 4,417,323
10 4,417,324
185 4,417,325
190 4,417,326
203 4,417,327
4,417,328
4,417,329

CLASS 366

80 4,416,543
85 4,416,544
99 4,416,545
102 4,416,546
150 4,416,547
168 4,416,548
190 4,416,549

CLASS 368

88 4,416,550

CLASS 369

32 4,417,330
60 4,417,103
111 4,417,331
266 4,417,332

CLASS 370

66 4,417,333
85 4,417,334
110.1 4,417,335

CLASS 371

20 4,417,336
22 4,417,337
37 4,417,338
4,417,339

CLASS 372

58 4,417,340
72 4,417,341
87 4,417,342

CLASS 373

73 4,417,343
93 4,417,344
101 4,417,345
137 4,417,346
158 4,417,347

CLASS 374

31 4,416,551
117 4,416,552
165 4,416,553

CLASS 375

40 4,417,348
60 4,417,349

CLASS 376

107 4,416,845
249 4,416,846
253 4,416,847
260 4,416,848
296 4,416,849
310 4,416,850
399 4,416,851
438 4,416,852

CLASS 377

8 4,417,350
4,417,351
18 4,417,135
43 4,417,352

CLASS 378

4 4,417,353
19 4,417,354
49 4,417,355
177 4,417,357
181 4,417,356

CLASS 381

94 4,417,098

CLASS 384

95 4,416,554
415 4,416,555

CLASS 400

144.2 4,416,556
152 4,416,557
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705.1 4,416,560

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CLASS 406

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123 4,416,568

CLASS 408

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CLASS 409

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CLASS 410

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CLASS 411

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397 4,416,574
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386 4,416,599
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488 4,416,596

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111 4,416,855
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261 4,416,859

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344 4,416,863
474 4,416,864

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59 4,416,868
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177 4,416,871
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107 4,416,906
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502 4,416,910

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106 4,416,639

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505 4,417,075

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D2—	24	271,440		198	271,456		38	271,472			271,488		76	271,504		29	271,520
	276	271,441			271,457			271,473			271,489		106	271,505		30	271,521
D3—	40	271,442		245	271,458		50	271,474			271,490		171	271,506		38	271,522
	61	271,443	D7—	13	271,459		103	271,475		76	271,491		200	271,507			271,523
	74	271,444		137	271,460		109	271,476		106	271,492		201	271,508	D25—	63	271,524
	76	271,445		150	271,461		111	271,477	D15—	7	271,493		208	271,509	D26—	37	271,525
D6—	63	271,446		305	271,462	D11—	6	271,478		10	271,494		213	271,510		60	271,526
	69	271,447			271,463		162	271,479		29	271,495	D22—	7	271,511		63	271,527
		271,448	D8—	301	271,464	D12—	187	271,480		80	271,496			271,512		85	271,528
	83	271,449		367	271,465		192	271,481		139	271,497	D23—	1	271,518		118	271,529
	95	271,450			271,466		196	271,482	D16—	33	271,498		23	271,513	D28—	7	271,530
	125	271,451		382	271,467		300	271,483	D18—	28	271,499		25	271,514		46	271,531
	149	271,452	D9—	377	271,468			271,484	D19—	91	271,500		48	271,515	D32—	2	271,532
	157	271,453		425	271,469		332	271,485			271,501		69	271,516	D34—	18	271,533
	180	271,454		457	271,470	D14—	3	271,486	D21—	24	271,502		150	271,517			

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